COAL AGE

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One Great Asset—Confidence

RECENTLY I watched the auditor of a big coal company sign vouchers amounting to thousands of dollars for mine supplies, not one article of which he had ever seen. I could not resist asking, "How do you do it when you never see the stuff or its quality?" He answered in one word, "Confidence."

Pointing to certain cabalistic marks and initials on the vouchers, he continued: "Those are the evidences that we got the material, that it is O. K., and that the money is due. I am sure of my associates in the company I work for. In turn, when my cost sheets go to the men higher up, they may ask for certain details; but they never question the cost itself. Confidence is the essence of our work."

My visit with the auditor started a train of thought. If a big concern can formulate a system that permits payment of millions in money, based on nothing more than trust in others, why shouldn't the whole mining industry adopt for its slogan the single word "Confidence"?

It will work wonders.

First—Between a Coal Company and Its Customers

DON'T make a promise or a contract with any of your customers unless you intend to live up to your word. If you contract to deliver coal at so much per ton over a certain period, do it even if you have chances galore to sell your product for more. Establish confidence in your customers' opinion of your concern. The coal business is a mighty human business after all. One man wants to be kept warm, another asks to be assured of a supply of power. It's up to you to gain their confidence in you, to furnish the thing they want without any haggling.

Second—Between the Management and the Men

THIS point of contact is the vital spot in every organization. It is here that the square deal exercised by both parties may bridge the gulf of suspicion with the strong girders of confidence. Is yours a concern with a manager who is self-centered, who will not repose confidence in his foremen and workmen? Or is your company one where the bosses refuse suggestions from the men under them, believing that they know it all? If so, cut loose from such ancient moorings and start afresh with confidence at your masthead. Take the rank and file into your deliberations frequently. Some companies give copies of annual statements to employees as well as directors. Ignorance of conditions and financial results often causes men to act blindly and unwisely.

Men, have confidence in your company and in your bosses. Let them know you are pulling for the welfare of the concern. Its success is your success. When a man likes his employment, it becomes the real touchstone of his happiness. No person can live in contentment unless he believes in his business and the men associated with him in it.

Ideas and Suggestions

The Art of Handling Men

By H. F. Dickson*

One question that continually arises in most of the state examinations for certificates of competency as mine officials is, What qualifications other than those required by law should a man possess in order to make an efficient official?

To the casual observer the requirements would seem to be fully covered by the law. But the question rightly divines that there are other qualifications that the law does not specify.

A young fellow sitting for his fireboss' certificate answered the question something like this: He should be able to read a blueprint of a mine; understand ventilation; be faithful to duty; be a subscriber to at least one good mining paper, so as to keep posted on new methods of mining and receive the benefit of the ideas and the experience of others; be able to handle men, and not allow religion and politics to interfere with his work.

Discussing the questions after the examination, in the presence of the inspector and others, he told how he had answered this particular question. There was a laugh at the last part of his answer. The inspector, however, remarked that he had given a good answer, and added that "ability to handle men" was the answer required.

Few are the men who are born with this qualification. But it can be acquired to a high degree, and it is essential that it be acquired early in one's career.

The secret of handling men can be summed up in one word—Appreciation. None can gainsay this. It is true not only in mining, but in every walk of life.

For example, a man comes into your home; he is genial and pleasant. After greeting those present, he will probably take the baby on his knee, recite a Mother Goose rhyme, say something complimentary about the home, admire the wall paper or some article of furniture; nothing is too unimportant to escape a comment of appreciation. He refrains from fault finding, wisely seeing only the best. Probably you will wonder why everybody likes Bill. That's easy; Bill appreciates the good in people and lets them know it, and he is always ready to lend a hand when needed. Bill gets along in life and you are naturally attracted to him. He is keen and observant, storing up experience in his mind for possible emergencies. He is always welcome at your home.

Another man comes into your home, and although you have the finest baby in the world he would never notice it. The most fragrant bouquet of flowers on your table would elicit no comment from him. When he spoke it would be of himself, of what he had done, or what he was going to do, or how ill he had been feeling of late. He sees nothing to appreciate in others, but likes to hear others laud his exploits. You are glad when he has gone and hope it will be a long time before he comes again.

*Roscoe, Penn.

What connection has this with the success of a mine official? It merely illustrates the application of the principle of appreciation; for, indeed, appreciation is a principle and differs only from one walk of life to another in the method of applying it.

There goes an assistant foreman through his section. He does not look upon the men under him as fellow-workers who, like himself, are striving to earn an honest living and provide for their dear ones. He sees them only as a body of men who must be kept in submission to his will. He sees no link that binds him and them together; therefore he is quick to find fault for the slightest infraction of the rules. He has no word of commendation for the man who keeps his place in a safe condition, but takes it as a matter of course. He is quick to blame, but slow to voice his appreciation. The men heartily dislike him. There is a lack of harmony, and without harmony their can be no success.

The successful man who understands human nature will commend, advise and appreciate by such remarks as: "That's the way I like to see a place posted," or "This place is in as fine a shape as any I have ever been in," or "You've got a dandy road in this place." Don't you think the men like to hear such remarks? They certainly do. And they will continue to keep their places in good shape because of such remarks.

Of the two men cited, one will get results and also the good will of his men. The other may get results by his bulldozing tactics, but accompanied with the dislike of his men; and the dislike of the men is too high a price to pay for results.

A foreigner who was an excellent timberman quit his job suddenly without any apparent reason. Some time later a man for whom he had formerly worked met him and asked him if he was still working at the mine. Shrugging his shoulders, the first man replied: "I quit my job because I no like to work for —— ——. He all the time growl." Then, naming another assistant, he said: "Him the best fellow I ever work for. He talk to everybody. Him dandy boss; but that other boss, I can no stand for him; him no good. I just quit." This man was far beyond the average as a workman and could be sent to any part of the mine to perform any kind of work. Everyone was sorry that he had quit, but the intolerance of the assistant boss drove him away from the mine.

Words of praise cost nothing, but pay big dividends. It does not necessarily follow that an official need overlook the glaring faults of any of his men, but he should remember that we are all prone to make mistakes. If you are quick to reprimand a man for a fault, be quicker to commend him for work well done. Be severe when necessary, but never hold a grudge against any man. Show your faith in the men; if you haven't any faith, cultivate some right away, or you will not go very far on the road to success.

If the inspector or some other high official were to go over your section and make complimentary remarks

regarding its condition, you would feel elated; and the appreciation would be an added incentive to you to keep your section up to the mark. Your words of praise will have the same effect on the men under you.

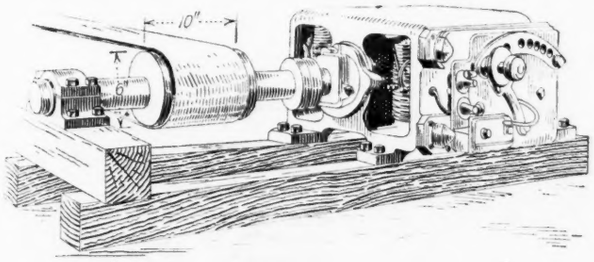
Coöperation with harmony is the keynote to success. After all, what else do we get out of this life but the association with one another? Life is too short and friends too few to be a bulldozer, when a better and broader way may be yours. By observing the faults of others wise men correct their own. Let us get wise.

An Emergency Fan Drive

By Joseph Virgin*

A short time ago I had the misfortune to have two armatures burn out almost simultaneously. As one of these was from the motor driving the ventilating fan, it looked as if the mine would be shut down for some time while either one of the armatures was rewound or a new one procured.

To avoid this I had the motor taken off a Jeffrey No. 17-A machine. When this motor was provided with



ARRANGEMENT OF TEMPORARY FAN DRIVE

a suitable extension shaft equipped with an outboard bearing, a suitable belt pulley and shaft coupling, as shown in the accompanying illustration, it operated the fan satisfactorily until repairs could be made to the regular motor. By resorting to this expedient the fan was got back into operation by 8 p.m. of the day upon which the burnout occurred.

There is doubtless nothing radically new in this method of driving a mine fan in case of emergency. The idea, however, may be of value to someone who may some time be "up against it" for a temporary drive.

Powder Ignited by Spark ?

In a recent issue of *Coal Age*, the question was asked as to the possibility of gas being ignited by sparks from the bits of an undercutting machine. In my opinion it is not only possible but probable. However, the question brings to mind an accident which occurred about a year ago.

The miner had a charge of powder wedged in the hole and was attempting to force it back with a copper-tipped tamping bar. Contrary to the advice of his buddy and a driver, he persisted in pounding on the shot, with the result that the powder ignited and both miners were seriously burned.

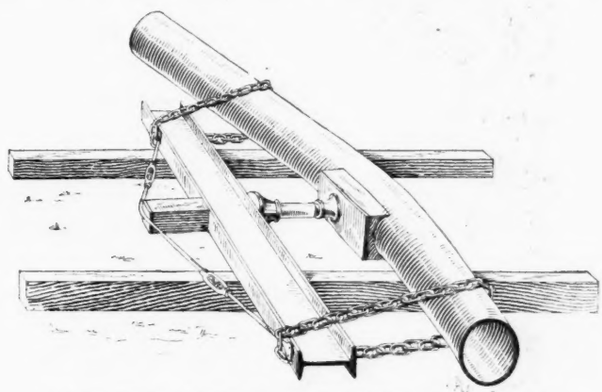
With several officials of the mining company I personally examined the working place immediately after the accident occurred. The tamping bar was found about 30 ft. from the face, and from its position and the testimony of the miners and the driver, we were convinced that the accident happened as stated.

After discussing the accident, we finally agreed that a piece of "sulphur" must have been knocked loose in the hole; striking this "sulphur" produced the spark, with the above-described result. Should there be any views to the contrary, as to the cause of the ignition of the powder, it would be interesting and instructive to have it discussed in *Coal Age*.

[What do *Coal Age* readers think of the occurrence and the idea here presented?—Editor.]

Labor-Saving Pipe-Bending Machine

A labor-saving device that is used by the Philadelphia Suburban Gas and Electric Co., Chester, Penn., for the cold bending of 8-in. pipe, will appeal to mining men who have long pipe lines to lay. The machine is described by Charles Wilde in a paper presented at the October meeting of the American Gas Institute and in *Engineering and Contracting*, Jan. 10, 1917. The arrangement consists of a 10-in. I-beam, 10 ft. long, braced with 1¼-in. tie-rod, two ¾-in. chains 8 ft. long and an ordinary 20-ton screw jack and block. To operate, all



AN EASILY MADE PIPE-BENDING APPARATUS

that is necessary is to link the chains around the pipe and I-beam by means of a slip link, place the jack and pipe block in position between the pipe and the beam, and then by the force of the jack make the bend. If the bend required is only a slight one, it may be made without any shift of the machine. If it is of any considerable extent, the machine should be shifted one way or the other, bending the pipe a few degrees until the required bend is made.

With this machine four men can make a bend in an 8-in. pipe, depending of course upon the radius and degree of the bend required, in from ½ to 2½ hr., at a labor cost of from 50c. to $2.50 a bend.

Growth of Bituminous Coal Preparation in Europe—Germany, forced to use her poorer grades of coal and to mine the thinner seams, led the way in bituminous coal preparation in the decade 1870-1880. France and England followed, as like pressure was felt, until by 1895 preparation by sizing and cleaning was highly developed in these countries. One German colliery at the present time prepares 20 sizes and grades of bituminous coal. Belgium divides her small production into five degrees of quality and into 12 standard sizes. In general, European technique in bituminous coal preparation is more advanced than in this country.—E. A. Holbrook in "Dry Preparation of Bituminous Coal at Illinois Mines," University of Illinois Bulletin No. 88.

*Moundsville, W. Va.

The Sterling Coal Mine

By Wilbur Greeley Burroughs*

SYNOPSIS—The haulage system in this operation is highly developed. Storage-battery locomotives handle the cars to and from the rooms; light haulage machines transport the cars to the main haulage road; heavier motors then haul them to the tipple. Each light storage-battery locomotive supplanted three men formerly employed for moving the cars to and from the face.

Efficiency, both in the employment of labor-saving devices and in management, is a feature of the coal-mining operations carried on at the mine of the Sterling Coal Co., three miles west of Salineville, Columbiana County, Ohio.

The region is much dissected by stream erosion, which has formed numerous valleys between which rise the hills containing the coal. The coal mined lies 50 ft. above the No. 6 coal bed, but is local in extent. The measure worked is approximately horizontal and varies from 2 ft. 2 in. to 2 ft. 6 in. in thickness. It is covered by slate, which affords a firm roof, and is underlain by fireclay.

The coal is reached by a slope, which comes out on the side of the hill about 200 ft. from the top. Mining is carried on by the room-and-pillar single-entry system. The coal is produced on 11 butt entries with from 12 to 15 rooms per entry. Rooms are 21 ft. wide and 300 ft. long. Breakthroughs, staggered, are cut every 60 ft. The pillars are never drawn. Five Jeffrey shortwall mining machines and seven Jeffrey breast machines are employed.

Water encountered in the workings is removed by four Fairbanks-Morse 3-in. and two Harris 2-in. electric pumps.

A Brazil 12-ft. force fan, driven by a steam engine, provides ventilation. The air is forced into the air shaft, which is located one mile distant from the entrance to the main slope.

In the mine all rails and ties are of steel; 12-lb. rails are used in the rooms, 16-lb. in the butt entries and 35-lb. in the face entries. The ties are made in the company's blacksmith shop at the mine. They are so designed that no bolts are needed to fasten the rails to them. Both ends of the tie are bent as shown in Fig. 2, leaving an open space at *A*. Two 4-in. pieces of steel *B* are fastened to the tie, but left loose enough so that they will turn when struck a blow with a hammer. In laying the track the ties are placed the correct distance apart and the steel rails laid underneath the bent ends of the ties in the open spaces *A*. The steel pieces *B* are then struck with a hammer so that they revolve, closing the openings above the rails and binding them firmly against the ties.

Another device pertaining to the track has to do with the rails at the partings in entries. No latches or switch points are used. Switching is performed with a movable piece of steel, shown in Fig. 3. This was originated by E. B. McNichol, electrical engineer at the mine, and is employed in the following manner: Rails *E, G, H* and *K* are stationary. *A* is a movable piece of steel 12 in. long and notched as shown in the drawing. Portion *f* of the piece *A* fits in between the rails *E* and *G*, the notch *e* fitting against the point *d* of the rail *G*. The notch keeps the piece *A* from slipping. The rail *G* is now connected with the rail *E*, switching the cars onto the rails *G* and *K*. Thus by utilizing the piece *A* the cars are switched onto any track desired.

In getting out the coal in former times, the cars on being loaded at the face were pushed to the butt entries

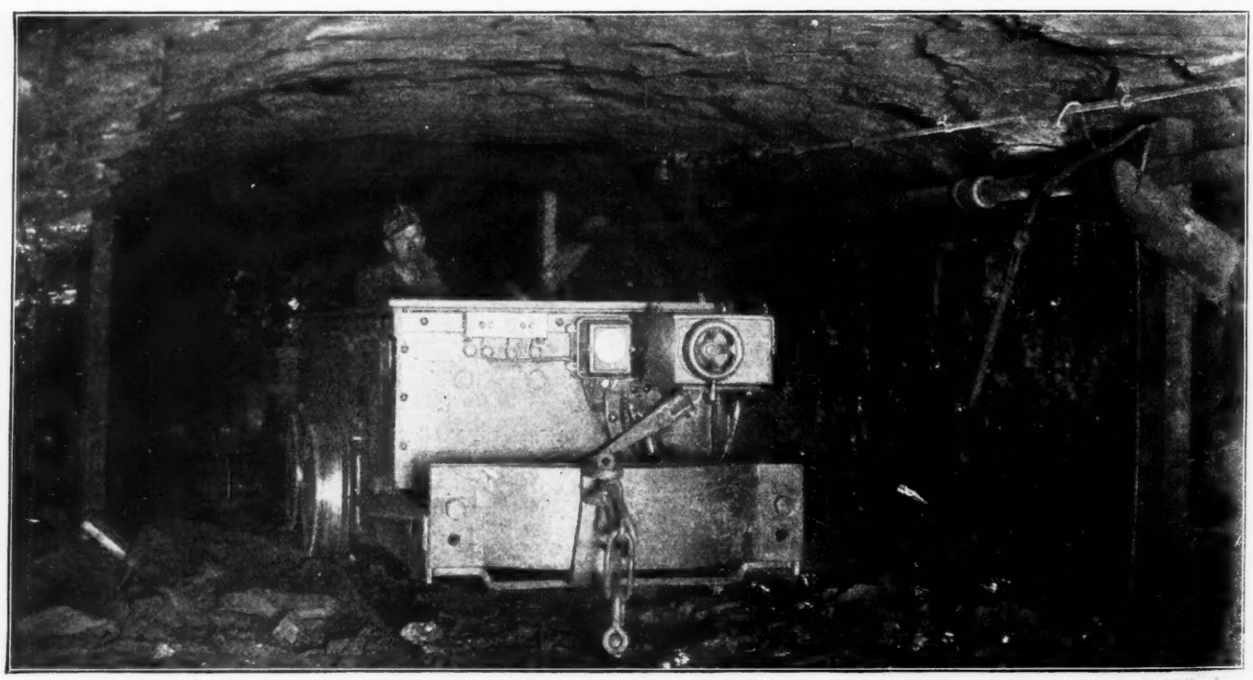


FIG. 1. LIGHT STORAGE-BATTERY LOCOMOTIVE WORKING IN AN ENTRY

*11 Wiley Ave., Chautauqua, N. Y.

by a crew of three to four men for each entry; 4-ton electric mine locomotives gathered these loaded cars left by the men, each locomotive making up a trip of 12 cars, which was taken to a parting on the main haulageway. At this point three of these 12-car trips were coupled together, making a trip of 36 cars, which another electric locomotive hauled up the slope and out to the tipple.

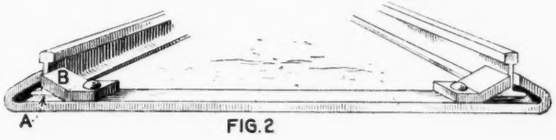


FIG. 2

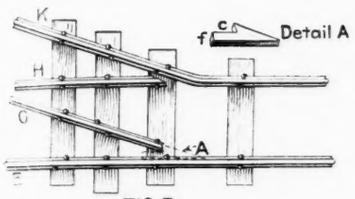


FIG. 3

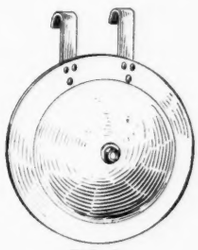


FIG. 4

FIGS. 2 TO 4. DETAILS OF TRACK AND ALARM GONG

The Sterling company has replaced the crews of men who pushed the cars from the face to the butt entries by 10 Jeffrey 2½-ton storage-battery locomotives, one locomotive operating on each entry. The electrical engineer states that this installation of storage-battery locomotives in place of men has eliminated 22 men. Also, the rooms have been lengthened from 150 ft. to 300 ft. Therefore, a room now lasts twice as long as previously; partings do twice as much service; much track laying and trolley wire installation are done away with, etc.

Each storage-battery locomotive gathers 12 loaded cars from and delivers 12 empty cars to the face each hour. While this storage-battery machine is waiting between trips for a Jeffrey 4-ton locomotive to take away the 12 cars that it has gathered, it has its charge increased by connecting up at its own charging station, which is located at a convenient point along the entry. A resistance is here used such that charging may be accomplished at 10, 20 or 30 amperes by moving a switch at the charging station. The main charging is of course done during the evening, after work has been completed for the day.

When the 4-ton locomotive arrives with 12 empty cars, it first pushes into a room the 12 empty cars together with the battery locomotive. Then it gathers the 12 loaded cars on the entry. The loaded trip is next taken to the room where the 12 empty cars and gathering locomotive have been left, and all are coupled together. The loaded and empty cars, together with the battery locomotive, are pulled into the entry, thus saving this work on the battery machine. Next the empty trip is uncoupled and the battery locomotive proceeds to distribute the empty cars, leaving them at the face of the rooms, while the 4-ton locomotive takes its trip of 12 loaded cars to the main parting. Here a Jeffrey 8-ton locomotive picks up three 12-car trips and hauls them in one trip of 36 cars to the tipple.

Thus the haulage consists of three stages: (1) Each storage-battery locomotive takes 12 loaded cars out of the rooms to the entry and distributes 12 empty cars to the face; (2) a 4-ton locomotive brings 12 empty cars to the battery locomotive to be distributed in the rooms and hauls the 12 loaded cars to the main parting; (3) an 8-ton locomotive at the main parting makes up three trips of 12 cars each into one trip of 36 cars, which it hauls to the tipple, and brings back its trip of empty cars.

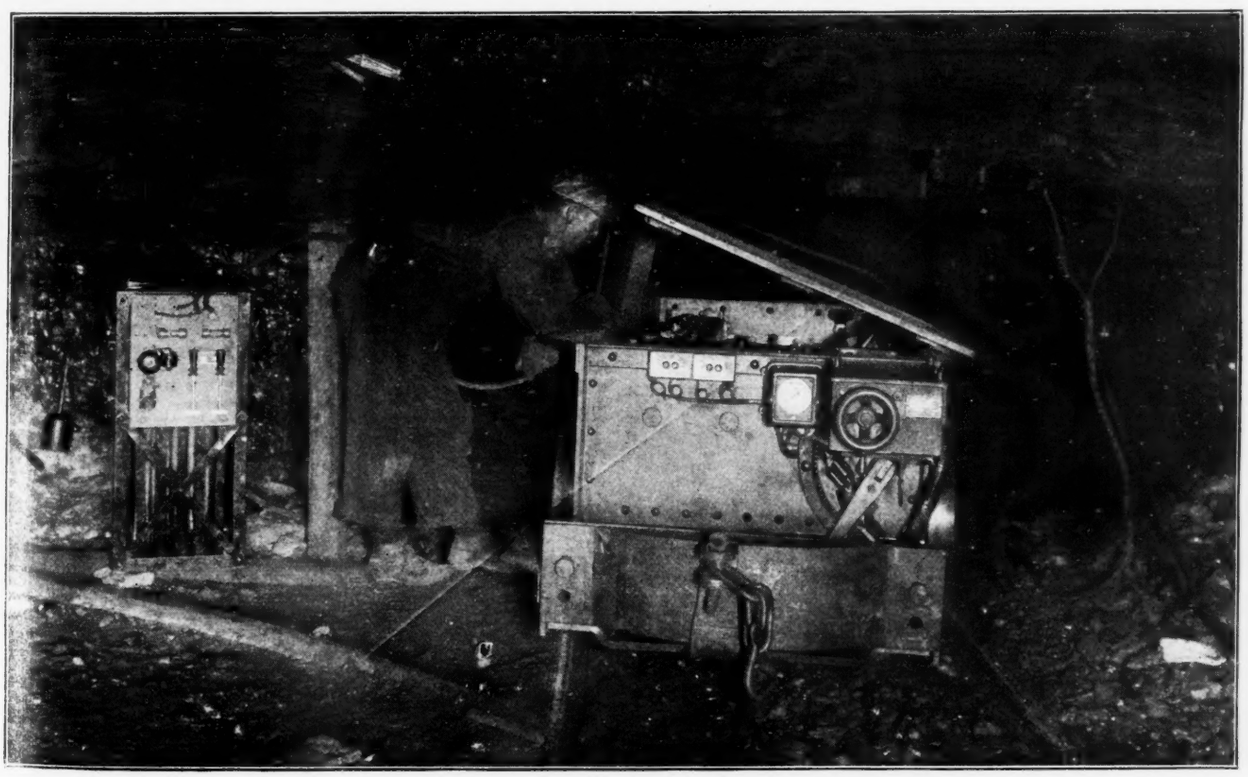


FIG. 5. CHARGING A STORAGE-BATTERY LOCOMOTIVE

Each day 26 or 27 trips are dumped at the tipple. The schedule of operation is so well systematized that it does not vary over one trip a day.

To avoid collisions between locomotives working on single entries where there is only one track, an electric signal system is used. When a locomotive comes out of an entry and goes down to a parting, its motorman throws a switch fastened to the rib of coal within easy reach, so that the man does not have to get off the locomotive in order to move the handle. This lights a red light in front of all butt entries, thereby warning all other locomotive operators that there is a motor on the main entry. They accordingly hold their machines stationary until the red light is extinguished by the motorman when his locomotive is off the main entry.

Another safety and at the same time labor-saving device in this mine is a gong 10 in. in diameter, which rings by vibration. It is fastened to the rear end of the last car in each trip by two hooks attached to its back. These hooks slip easily over the end gate of the last car when the trip is made up at the main parting preparatory to being taken to the tipple. The gong, ringing by vibration, does away with a trip rider and insures the safety of the miners, since the men in the entries are warned that the trip is coming by the clanging of the gong. If the trip backs up, the gong signals its approach. It also shows whether the entire trip is fastened together or has broken apart. As there are two main partings in this mine on which the trips are made up to be taken to the tipple, two men are eliminated by the use of this device. These gongs were furnished by the Electric Service Supplies Co., of Philadelphia.

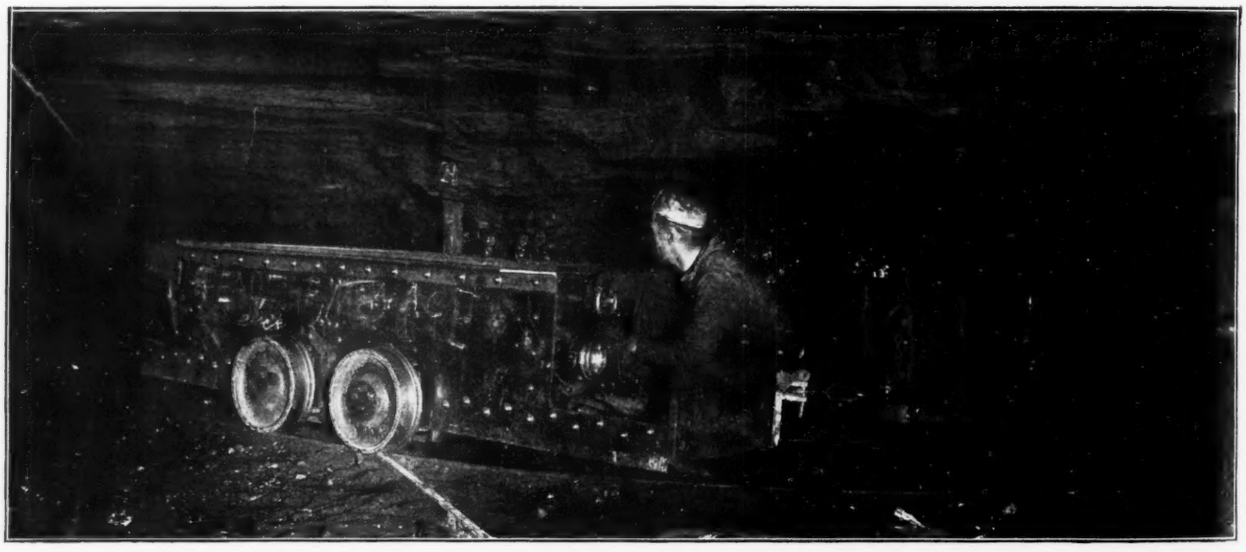


FIG. 6. LIGHT STORAGE-BATTERY LOCOMOTIVE HAULING LOADED TRIP

On leaving the mine the coal is taken to the tipple, which is between 300 and 400 ft. from the entrance to the slope. The locomotive brings the trip to a point where the cars are fastened to an endless rope, which leads them to a Phillips crossover dump; the empty cars are brought back by the endless rope and made up into trips to be taken back to the mine.

On being dumped, the coal passes into a large hopper from which it is elevated by an apron conveyor to shaking screens. (The hopper, conveyor and screens were made by the Webster Manufacturing Co.) The screens discharge the lump coal onto a Jeffrey combined picking table and loading boom by which it is delivered to railroad cars for shipment over the Pennsylvania R.R., a spur of which runs from Salineville to the Sterling mine.

Bone coal taken from the picking table is placed on a small refuse conveyor, which delivers it into a Jeffrey single-roll crusher. The crushed material leaving this machine is elevated by a bucket conveyor and discharged into a Jeffrey spiral conveyor which returns it to the loading boom whence it passes to the railroad cars.

The power plant at the mine is housed in a tile and cement building the floor of which is of cement, so built that it will readily drain off water turned upon it from a hose. This allows the place to be kept neat and clean. Three 100-kw. Morgan-Gardner generators are driven by two Skinner engines and one Ball engine. One 150-kw. Goodman generator is driven by a McEwen engine. Five 150-hp. tubular boilers, equipped with shaker grates, generate steam. Distilled water for the storage batteries is taken from the main steam header, which is equipped with an automatic steam trap.

All mine cars are constructed at the mine; and all repairing, both to cars and armatures, is also done there. To meet these requirements an up-to-date blacksmith shop is in process of construction. It is 40 x 20 ft., one story high, of tile. It will contain a 50-lb. Little Giant power hammer, made by Mayer Brothers, of Mankato, Minn.; an emery wheel, drill press, circular saw, and a motor with flexible shaft for drilling holes in the woodwork of mine cars. The three forges are supplied with air by a motor-driven fan. Near-by stands the electrical shop, containing a lathe, small planer, drill press and emery wheels.

The main office of the Sterling Coal Co. is at Toronto, Canada. The United States office is at Cleveland, Ohio. Mr. McNaught is president and H. D. Hileman general manager. E. B. McNichol, electrical engineer, originated the labor-saving devices and details of getting out the coal. It is to him that I am indebted for information and courtesies shown while at the mine. Photographs taken within the mine were furnished by the Jeffrey Manufacturing Co., of Columbus, Ohio.

Reducing Ventilation at Firing Time

By William E. Holland*

SYNOPSIS—The question of reducing the circulation of air in a mine a short time previous to blasting dependent on conditions. Its purpose is to lessen the liability of dust explosion due to blasting and which largely depends on the air supply. Instance recalled of a violent explosion that followed the sinking of an air shaft nearer the working face in a large mine in Iowa where the ventilation had become poor owing to the extensive development of the mine.

In the short time allotted me this morning it is hardly possible to do justice to the question of maintaining or reducing the circulation of air at the time of firing. In our state the question has caused much controversy. I fear its suggestion here may provoke as much discussion as that of "The Use of Permissible Powders in Mines," to which we have listened with much interest. The discussion reminded me of a story told of the manager of a powder mill who found it necessary to request a number of visitors who desired to be shown through the place, to first throw away their cigars. They did not appreciate the conditions they were about to face. The same may be true in regard to the question of stopping the ventilating fan at firing time, which is largely a question of conditions prevailing in the mine.

In the first place, I want to ask, Why stop the fan at firing time? The answer to that question is, So as to reduce the circulation and prevent the occurrence of dust explosions that are liable to follow the firing of shots.

Factors Essential to Dust Explosion

There are three factors that enter very prominently into every dust explosion in mines: namely, solid shooting, dust suspended in the air, and a liberal supply of oxygen. The argument is advanced that, with the reduction or removal of one or more of these factors, the liability of an explosion occurring is reduced in that proportion. Now, as we all know, the great danger of solid shooting is the tendency of the miner to drill his hole to a depth that the charge of powder has no opportunity to perform its work. Again, many miners have the habit of placing one shot behind another, thus making the second shot dependent on the first, which must execute its work before the second charge explodes. Too many shots are fired in a tight place, causing a blownout or a windy shot, with the result that much fine dust is blown into the air and may be ignited by the flame of the succeeding shot and cause a local explosion of dust.

But, as oxygen is necessary to combustion and flame can neither be kindled nor propagated without a sufficient supply of that element, it seems only reasonable to conclude that the less oxygen there is in a mine at the time of firing, the less danger there will be for the ignition of dust and the propagation of flame throughout the airways and the mine. However, I believe there are limitations to this practice.

There is, in my district at the present time, a mine advanced so far that the firing of shots produces a large amount of carbon dioxide, filling the workings with blackdamp to such an extent that I have found it necessary to order them to run the fan slowly when firing. Without doing this, it was impossible to keep the mine clear of blackdamp.

I want to cite a case that, if Mr. Beard was present, he would probably recall, as he was mining engineer for the company at the time the incident I am about to narrate occurred. I believe it was in the year 1887, that the workings in mine No. 2 of the Whitebreast Fuel Co. had advanced so far underground that it was impossible to get the necessary ventilation in the workings. In order to furnish more air in the mine, it was decided to sink another shaft nearer the working face and move the fan to that location.

Prior to that time, the miners fired their own shots, and there were no windy shots reported; but, immediately following the sinking of the new shaft and for two years thereafter, especially in the winter time, it was a common thing for small dust explosions to occur and men were carried out of the mine seriously burned. It was not then known what was the real cause of the trouble.

Remarkable Escape of a Shotfirer

Allow me to cite another instance that occurred in my district about two years ago. A new mine had been opened, which I wished to safeguard by every possible precaution. I recommended the loading out of all drill dust and the sprinkling of all roads and passageways. I also asked them to cut a refuge hole in the solid coal for the shotfirer. This refuge hole was to be closed by a heavy door, and the shotfirer was instructed to light only a few shots at a time and retire to this place of refuge and wait until all the shots had gone off.

For a time, everything went well; but one night there were two shots to be fired that the shotfirer had not the courage to refuse to light, as the law allowed, although he regarded them unsafe. One of these holes started 6 in. from the bottom and was 5½ ft. deep, while the second hole, just above that one, was 6½ ft. deep. The bottom shot went off first but did little more than raise the dust, which was blown into the air. The heat and dust of the first shot made conditions fine for a dust explosion when the second shot went off. The result was as violent an explosion as I ever knew.

One of the cages in the hoisting shaft was blown 75 ft. to the top of the shaft, while the other cage at the upper landing was blown entirely out of the shaft carrying with it the sheave wheel. Every step in the manway, provided for the escape of men, was blown from the shaft. In this explosion the flame traveled 600 ft. The shotfirer had barricaded himself in the refuge hole and braced the door with a timber or plank 3x10 in. and 8 ft. long. The pressure was so great on the door that the timber was broken, but the shotfirer escaped injury and, going to the hoisting shaft, was hoisted soon after by a rope lowered from the surface. To my mind this and similar accidents are sufficient proof that too much oxygen in the mine air at the time of firing is dangerous.

*State mine inspector, Albia, Iowa. Address delivered before the Mine Inspectors' Institute of the United States of America, June 15, 1916.

Surveying Methods in the Anthracite Regions

SYNOPSIS—Brief description of the surveying methods adopted by one of the large anthracite companies. Size of the parties and duties of each member, together with the system of keeping records and map making are described.

Each division of the Black Coal Co. has its own corps of engineers, under the direct charge of a division engineer. The collieries in each division are divided into districts, each district being under a district transitman, who has charge of the engineering work in two or three collieries, depending on the size of the workings. In each district are two or three transitmen, who have all the regular surveys, or postings, to run, and one or two assistant transitmen, who act as first notemen on postings and who set the lines after the postings are worked up in the office. In addition to these men who are regularly assigned to the different districts, there are enough other men, rated as second notemen, foresights and backsights, to make it possible for each division to have two or three full corps in the field at one time.

Personnel and Equipment of the Corps

In the collieries operated by the company, the surveys of new workings, which are called postings, are run every three months. For this work, the regular corps is made up of five men—a transitman, who is chief of the party; a first noteman, a second noteman, a foresight and a backsight.

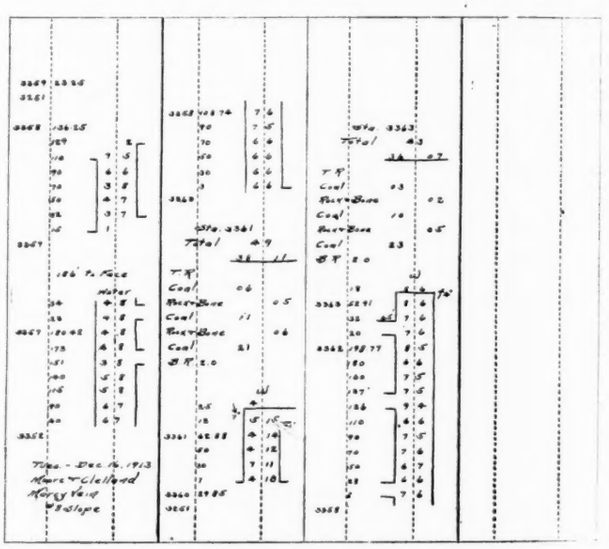
The transitman runs the transit, keeps the transit notes and directs the work of the entire corps. The first noteman handles the 300-ft. tape, selects the points for the new stations, keeps the sidenotes and the vein sections, and is held responsible for the work of the front end of the corps. The second noteman assists in setting up the instrument, runs the sidenotes and measures the vein sections, assisting both the foresight and the backsight as they may need help. The foresight drills the station holes, paints the number and symbol used to designate the station, measures the roof height of the new station and shows the elevation for the vertical angle. The backsight helps set up the instrument, shows sight at the backsight station and holds the zero end of the tape at the transit, helping the first noteman to measure the distance. The corps is also always accompanied by an assistant foreman, who examines each place to determine its safety before any one in the corps is allowed to enter it.

The company uses the continuous azimuth method of surveying, so the transits have the horizontal limb marked twice in the same direction, clockwise, from 0 to 360 deg., the zeros being 180 deg. apart. Since the elevations are carried by vertical angles, all posting transits are fitted with a vertical arc of 180 deg., graduated to ½ deg., and reading to minutes by means of a vernier. All transits are fitted with adjustable crosshairs, without stadia wires, as no stadia work is done by the company. Since check needle readings must be taken on each sight, all transits have a compass box. Extension tripods are used to facilitate the setting up of the instrument.

For all work in which stations are thrown in, a 300-ft. steel tape is used. These are ⅛ in. wide and are graduated to feet, the decimal parts of a foot being read by means of a measuring pin, which is a 6-in. brass pin graduated to hundredths of a foot. Two styles of measuring pins are used, the first and more common being a ⅛-in. round pin divided into tenths and hundredths, and the other being a flat brass scale marked on one side from zero to five-tenths and on the other from five-tenths to one foot.

For measuring roof heights, instrument heights, vein sections, etc., 25- and 50-ft. metallic linen tapes are used. The metallic tapes are also used in measuring the sidenotes where an especial degree of accuracy is required, but for the ordinary work of running sidenotes a 7-ft. "sidenote stick" is used.

In the flat workings of this field the jigger station is used almost exclusively by the company and two jigger rods, of a length suitable to the height of the beds, are in the equipment of each corps. The foresight rod is sharp-



SKETCH SHOWING METHOD OF KEEPING SIDENOTES

ened at one end, so as to permit the drilling of a station hole in the roof; at the other end, in addition to the grooved tongue for the string, is a cup of sufficient diameter to hold the handle of a paint brush, to allow the foresight to paint the station number in the roof when it is too high to be reached easily without the use of the rod. About a foot from the sharp end of the rod is a spool on which the surplus string is wound. The backsight rod is similar to the foresight rod, but has no cup for a brush and often has a blunt end instead of a sharp one. The sharp end is preferable on all rods, however, it being necessary at some times to make holes in the bottom for the tripod, when the set-up station is not over a road.

In posting work two kinds of plumb-bobs are used—an iron bob for the foresight and a long brass bob for the backsight. The backsight, having to assist in setting up the transit, requires a bob which holds a point better than the one needed by the foresight, whose only use for the

bob is in setting a point below the station for the measurement of the roof height and for the approximate set-up of the transit over a spot on the bottom.

For marking the stations, the best quality of white lead is used, mixed with boiled linseed oil. When the roof is shelly, or is very heavily timbered, a spad station is used instead. The collar is barked on the side facing the transit and the spad put in so that a string can be hung through it in but one way. The Muirhead rustproof spad, 1¼ in. long, is used.

Other equipment carried by the members of the corps consists of a pitch rule, carried by the second noteman and used in the face of each place to get the degree of rise or dip of the place, and at each change of pitch, knuckle or basin, so they may be accurately located; a 50-ft. metallic tape for the second noteman and a 25-ft. metallic tape for each sightman; a steel T-drill and a jumper, carried by the foresight for the purpose of drilling the station hole in roof which can be reached easily; a paint can, containing enough white lead and linseed oil for a day's work; and an oil can, for the lights, carried by the backsight.

Progress of the Mine Work

In starting the fieldwork of a posting the two inside stations are identified beyond any doubt, after which the backsight and second noteman drop a plumb-line from the station in the roof to a point on the bottom and measure the distance between the two. While they are doing this, the transitman is looking up the stations in his transit book, recording the backsight course and giving any needed instruction to the men at the head end of the corps.

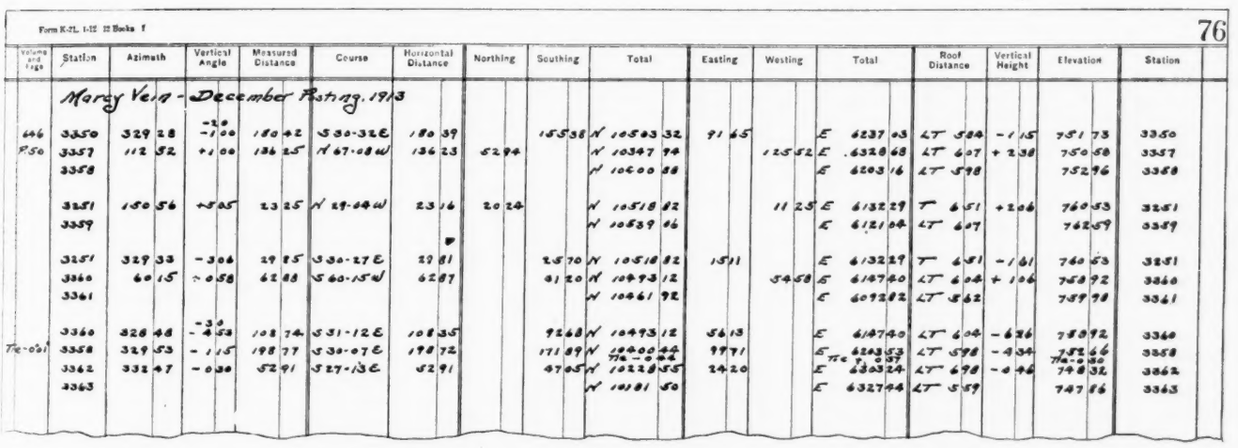
As soon as the stations are identified, the first noteman and foresight locate the point for the next station, the first noteman unreeling the 300 ft. tape as he goes. The tape is stretched between the two stations as soon as possible, and the second noteman at once starts the sidenotes. These notes are given at intervals of not more than 20 ft. and as much closer as conditions demand. Vein sections are taken by the second noteman in every third chamber and in every gangway or airway.

During the running of the notes, the transitman has taken the backsight and foresight, recorded the roof height at the foresight station and taken the vertical angle between the two stations. As soon as the notes are finished, the first noteman and the backsight measure the distance, which is recorded in both the transit book and in the sidenote book, the distances being checked at the end of each day's work.

The reason for the measurement of the roof height at the set-up station and at the new stations is for the purpose of carrying the elevations. All elevations appearing on the maps are shown as on the bottom; but since the conditions on the bottom are always changing, the elevation of the roof is taken as the fixed point from which the new elevations may be calculated. This work is shown in the figure illustrating a page in the permanent office record, or folio, as it is known.

Numbering the Stations

The method of numbering the stations varies in different collieries. If the colliery is a comparatively small one, and calls for so little transit work that the station number will not run up to more than four figures, then but one set of numbers and one set of notebooks is used for the entire inside workings. If each vein or the workings in each opening are of such size that the number of stations runs up rapidly, then different series of numbers and different sets of books are used for each vein or each opening, as the case may be. When two or more series of numbers are used for a colliery a special symbol is painted for the stations in each vein. For example, in the Red Ash vein, an L may be used; in the Baltimore vein, an A; and in the veins above the Baltimore, a circle.



Form K-2L 1-12 12 Books 1 — 76

Volume and Page	Station	Azimuth	Vertical Angle	Measured Distance	Course	Horizontal Distance	Northing	Southing	Total	Easting	Westing	Total	Roof Distance	Vertical Height	Elevation	Station
	Mary Vein - December Posting, 1913															
446	3350	329 28	-2.0 / -1 00	180 42	S 30-32 E	180 39		155 38	N 10503 32	91 65		E 6237 03	RT 5.04	-1 15	751 73	3350
P50	3357	112 52	+1 00	136 25	N 67-08 W	136 23	52 94		N 10347 94		125 52	E 6320 68	RT 6.07	+ 2.38	750 58	3357
	3358								N 10600 88			E 6203 16	RT 5.98		752 96	3358
	3251	150 56	+5 05	23 25	N 29-04 W	23 16	20 24		N 10518 82		11 25	E 6132 29	T 6.51	+2.06	760 53	3251
	3359								N 10539 46			E 6121 04	RT 6.07		762 59	3359
	3251	329 33	-3.04	29 85	S 30-27 E	29 81		25 70	N 10518 82	15 91		E 6132 29	T 6.51	-1 61	760 53	3251
	3360	60 15	-0 58	62 88	S 60-15 W	62 87		31 20	N 10493 12		54 58	E 6147 60	RT 6.04	+ 1.06	758 92	3360
	3361								N 10461 92			E 6092 02	RT 5.62		759 98	3361
	3360	328 48	-3.0 / -4 53	102 74	S 31-12 E	102 35		92 68	N 10493 12	56 13		E 6147 60	RT 6.04	-6 36	758 92	3360
Tie-051	3358	329 53	- 1 15	198 77	S 30-07 E	198 72		171 89	N 10400 44	99 71		E 6203 53	RT 5.98	-4 34	752 66	3358
	3362	331 47	- 0 30	52 91	S 27-13 E	52 91		47 05	N 10328 55	24 20		E 6303 24	RT 6.98	-0 46	748 32	3362
	3363								N 10281 50			E 6327 04	RT 5.59		747 86	3363

THE PERMANENT OFFICE RECORD, SHOWING SYSTEM OF LATITUDES AND DEPARTURES AND ELEVATIONS

The field notebooks used are leather bound, measuring 6 x 4¼ in., two styles of ruling for the pages being employed, one for the transit and level books and one for the sidenote book. The notes are kept with a 3H pencil and no erasures are supposed to be made; if there are any corrections necessary, the incorrect value should be crossed out and the correct one written above it.

In the transit book the left-hand page is divided into five spaces and the right-hand page into four. These columns are used for the following entries: (1) Set-up, backsight and foresight stations; (2) azimuth; (3) course; (4) vertical angle; (5) measured distance; (6) horizontal distance; (7) vertical height; (8) roof distance and (9) remarks.

The accompanying illustration shows a sample page of transit notes. In the first line Station 3252 is the back-

sight, 3350 the set-up and 3357 the foresight station; the backsight course is found on the right-hand page, on the next line above, referenced to the place where it is found. The azimuth is 329 deg. 28 min. and from this the course is calculated as S 30 deg. 32 min. E, the south line being the zero azimuth. Above the course is written, in smaller figures, the needle reading, which must check within 3 deg. of the azimuth. The next column, that for the vertical angle, contains two sets of figures, which indicate that while the vertical angle is —1 deg., yet the sight was taken 2 ft. too low, and the difference in vertical height is really 2 ft. less than the angle indicates.

The next column contains the measured distance which must be reduced to the horizontal and vertical components for the vertical angle given. The next columns contain these two values, which are calculated in the office, after the completion of the fieldwork. The columns for roof distances and remarks are filled in in the field, the LT in the roof height indicating that the spot set below the station is level with the tie. In the line of notes for Station 3361 in the remark column is a W, indicating that the place was working at the time of the posting.

A record of a tie will be noticed in the transit notes. The rule adopted on the subject of ties is as follows: All surveys must be tied up, any station of which is 1200 ft. or more distant from the last tie. In running a tie, if old stations are run over, the distance and vertical angle between these must be remeasured and recorded, as if running over new stations. In tying up work a greater variation than 3 min. requires the work to be rerun. As a general rule, gangways or slopes are tied at about every 500 or 600 ft., and in some cases even oftener.

Method of Keeping Sidenotes

The sidenotes, as mentioned before, are kept in a separate book. This book is ruled differently from the transit book, having the page divided into two equal parts. A sample sidenote page is shown herewith. To the left of the first dotted line (shown in red in the book) is the space for the station and just to the right of the same line are written the pluses on the tape at which the sidenotes are taken. The second dotted line (also shown in red in the book) indicates the transit line, and the numbers to the right and left of this line show the distance from the transit line to the ribs. The distance through the inside crosscut is marked on the rib of the crosscut, and the dip of the vein is indicated by an arrow and the degree of dip.

At the face is a note showing any unusual condition encountered there, as in the notes for Station 3857; here at +34, at the inside rib of the crosscut, the place is filled with water, and the measurement to the face, 186 ft., has been obtained from the foreman. The same system of indicating whether or not the place is working is used as in the transit notes, a W meaning that the place is working and an S showing that it is stopped.

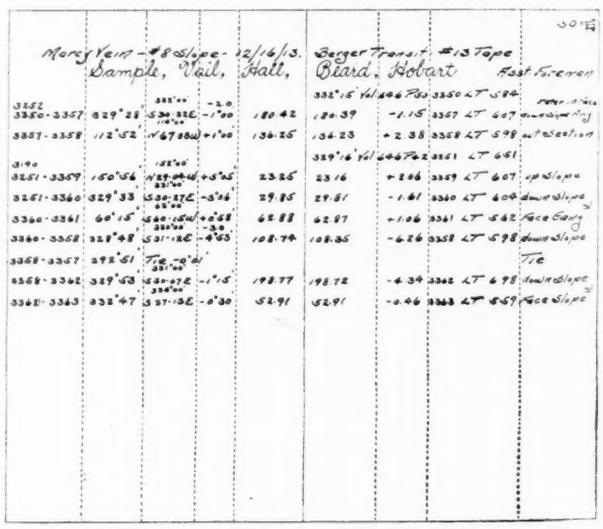
In the sidenotes and immediately following the notes for each place is shown the vein section where one is taken. The section for the vein at Station 3363, showing both BR and TR (bottom and top rock), shows that the full thickness of the vein is worked and that 2 ft. of bottom rock have been taken up to give the necessary height.

It will be noticed that there are no sidenotes recorded for Stations 3359 and 3360. By reference to the remark column in the transit notes, 3359 was thrown "up slope," and 3360 was thrown "down slope," the latter, however, being but 30 ft. Both of these stations, then, were thrown in at places where the sidenotes had been taken on a previous posting, and a repetition of the notes would have been of no value.

The Office Work

When the corps has completed the fieldwork if it is possible all the men are kept in the office until the calculations have been made and checked. The first noteman reads out the vertical angles and measured distances to the foresight and backsight, each of whom works out a set, using R. L. Gurden's traverse tables for the calculations. While the men are calculating the horizontal and vertical distances, the second noteman copies the vein sections into the section book kept in the office, using red ink for the coal and black ink for the refuse items. The first noteman checks the backsight courses and the bearings which the transitman has calculated from the azimuths. Either the transitman or the first noteman copies the transit notes into the office ledger, or folio, one of which is kept for each set of transit books.

After the horizontals and verticals have been worked and checked (all office work is checked by a second man), they are copied in the transit book, in ink and also entered in the folio in their proper places. The bearings for all



METHOD OF RECORDING TRANSIT NOTES

gangway and tie shots are given out, with the horizontal distances, and the latitude and departure for each such shot is calculated in the same manner and entered in the folio, after which the total latitude and departure and the elevation for each station is worked and checked. From this point on the work is all done by the transitman and first noteman.

The maps are laid out in 500-ft. blocks on a 100-ft. scale, Winsor & Newton's carmine moist color being used for the coördinate lines. The maps were formerly made in color, a different color being used for each vein and sometimes two or three veins being shown on the same map. All maps which have been made during the past few years, however, have been made with Higgin's waterproof black ink, no color being used except for the coördinate lines.

In plotting the field work the gangway and slope stations are plotted by their coördinate values and the chamber shots are plotted by protractor. The coördinate method of plotting is the most accurate, any error in the position of one station having absolutely no effect on any other station. After all the stations are plotted, they are checked by protractor, and the distances checked. The sidenotes are then plotted on and the map inked in. The stations are shown on the map by a small circle, the sight-line being drawn in. By each station is shown its number and the elevation, and all dips and the date of the survey are also shown.

Making the Tracings

The maps are used but little in the office after the tracings have been posted from them. All tracings are made with Higgin's waterproof black ink on the rough, or unglazed, side of the muslin, the coördinate lines, as on the maps, being made with the carmine moist color. On the maps the coördinate lines are drawn full across the sheet, but on the tracings only the coördinate intersections are shown, the lines extending ¼ in. beyond the intersection.

All of the data shown on the mine maps are reproduced on the tracings, and in addition the vein sections are shown. The center-lines for the gangways and chambers are also inked on the tracings, the carmine being used for these. The road and chamber numbers do not appear on the maps, but are shown on the tracings, and the course of all road and chamber lines is given on the tracings.

When the tracings have been finished the stop distances, beyond which the places may not be driven, and the royalty changes, or the distances at which the places enter a different property, are scaled off and shown on the blueprint, which is sent to the colliery, the stop distances being shown in red and the royalty changes being in yellow. A letter giving these distances is also sent to the foreman at the colliery.

A New Set of Centers Put In

Following a posting, a general spadding is made at the colliery, at which time all places which the posting showed to be off line are brought back on line, and all new places for which room has been made since the last posting are given lines. This work is done by two men, accompanied by the assistant foreman in charge of the section in which they may be working. Distances are measured with a 50-ft. metallic tape, the nearest foot being considered close enough for this work. The lines are set so as to allow the gob or refuse to be placed on the same rib of each chamber of a panel or section, so as to provide for the later removal of the pillars. In general the lines are set about 8 ft. from the clear rib. Lines set along barrier pillars and lines for new slopes or planes are tied up, and are plotted on the map instead of on the tracing, as are the other lines.

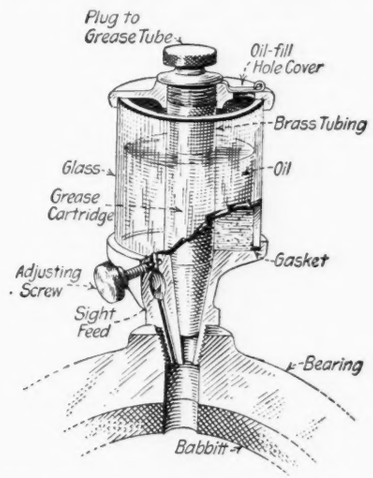
In addition to this regular work of posting and spadding the collieries the engineers make regular examinations of the silted territory in each colliery and also post the ventilation. In the latter work the position of all permanent stoppings, air bridges, pipe lines, engines and pumps, telephones, trolley and feed wires, are carefully noted and shown on the ventilation tracings, one of which is made for each vein.

Combination Grease and Oil Cup

I have often wondered why a combination grease and oil cup, in which oil is fed under ordinary conditions and grease retained for an emergency, has not been placed upon the market, says Thomas R. Tarn, in the Mar. 15 issue of *Power*. The object of such a device would be to prevent the overheating of a bearing should the oil passages become clogged or should the attendant fail to start the oil-cup feed or neglect to replenish the oil cup with oil.

Of course the grease could be compounded of such ingredients that it would become liquid at any desired temperature, depending upon the conditions to be met. The space between the glass body of the oil reservoir and the centrally located grease cartridge tube would act as a dead space, thereby preventing the heat from the bearing being dissipated before it melted the grease.

This device would be found well adapted for machinery in inaccessible places, or such machinery as could be stopped only at intervals. It could be used with advantage on parts of machines the motion of which would



GIVES OIL WHEN PROPERLY FED AND GREASE WHEN NEGLECTED

make it impossible to ascertain if the reservoir was at all times supplied with oil. It would be found serviceable where the machinery could be stopped only at agreed times, because at other times, lives and property would be destroyed. Other opportunities are where unskilled labor is used, where rotative speeds are high, and where failure to lubricate would entail costly repairs and the monetary loss that always results from curtailment of production.

This type of cup could be installed on mine fans, coal-handling, grinding or other machinery, where dust or grit is present, in dark places or where it is hazardous to go while the machinery is in motion. In fact it would be available and desirable on all machinery dependent on intermittent or hand lubrication.

I believe that such a device would prove an additional safeguard, would reduce to a minimum the liability of having hot bearings and of experiencing shutdowns and would be an assurance of constant service.

The Lehigh Valley Coal Co. Has Issued Orders requiring all assistant mine foremen to stay in chambers where the roof is bad until they have been made safe by the miner. Reliance will no longer be placed on merely ordering a miner to prop or timber his place. The foreman must see that it is done promptly and done right.

The Loss of Coal Through Grates*

By Carleton W. Hubbard†

SYNOPSIS—The loss of coal through the grates of an industrial plant is not a spectacular affair. It is rare that anyone connected with the plant concerns himself with it unless it has become so excessive that the ash pile catches fire. Like all other easily preventable losses that run their daily course, this constant slipping through the grate of combustible matter is taking dollars out of the profits. This article discusses the subject and gives two methods of determining the fuel losses.

There are two methods of determining the extent of fuel loss in the ashpit refuse in any given plant. The refuse that is shoveled out of the ashpit as ashes always contains more or less combustible matter. In this article the material that is removed from the ashpit will be called *refuse* and that part that is neither combustible nor moisture will be called *ashes*.

Some plants make a practice of weighing the coal as fired and also the amount of refuse removed from the ashpit. This is usually done not with the idea of determining the amount of combustible in the refuse, but of getting a figure for what is commonly, but incorrectly, called the ash in the coal. Under the best of conditions a certain amount of combustible will pass through the grate, and the amount of refuse removed from the ashpit gives only a slight clue as to the actual amount of ash in the coal and furnishes no direct measurement of the amount of combustible lost through the grates. If the plant systematically has its coal sampled and tested, the information thus furnished, together with a knowledge of the amount of coal fired and refuse removed, furnishes all the data necessary to solve the problem. For instance, if 1,200,000 lb. of coal is consumed per month and there is removed from the ashpits 180,000 lb. of refuse in the same time, it might be considered that the coal contained 15 per cent. of ash. If the coal used was sampled and tested and the tests showed that the coal as fired contained 12 per cent. of ash, it would be evident that the loss of combustible through the grates was 3 per cent.; if the tests showed that the coal contained 8 per cent. of ash, the loss through the grates would be 7 per cent. of the coal as fired.

Combustible from Ashpit Refuse

Another somewhat theoretical method of determining the amount of combustible lost through the grates, but which in practice has checked up closely with the results obtained by the first method, consists of sampling the refuse from the ashpit and determining the amount of combustible in it. It should be understood that the expression, "22 per cent. of combustible in the refuse," means that 22 per cent. of the sample of refuse is combustible matter and does not mean that 22 per cent. of the combustible matter shoveled into the furnace found its way into the ashpit.

This method, like that of weighing, requires a knowledge of the proximate analysis of the coal, but it has a decided advantage over the first method in that it is not necessary to weigh the ashpit refuse. It may be objected that this method makes too much depend on the sampling of the refuse, and this is a valid objection but not an unconquerable one. In a plant where the two methods were being used at the same time, and without any knowledge on the part of the operating force that one was being tested against the other, the results over a period of two years checked closely. There is no special reason why they cannot be duplicated elsewhere.

The second method is a more rational one of determining the loss of fuel than the first, which depends entirely upon weights and tacitly assumes that all parts of a pound of the combustible matter in coal is of equal heat value. This is contrary to the facts, for it is easily demonstrable that, pound for pound, the volatile matter in the coal produces more heat than any other part. In developing this method, it became necessary to determine the character of the combustible in the refuse.

No Volatile Matter in Refuse

A lengthy series of experiments was run on samples of refuse from coal of the four following classifications: Anthracite, semianthracite, semibituminous and bituminous. It was found that, no matter what kind of coal was used, the combustible in the refuse contained practically no volatile matter and was in reality nothing but coke. Owing to the large amount of ash accompanying this combustible, it was impossible to burn it in a calorimeter in order to find its heat value, and there appeared to be no serious error involved in assuming that the heat value of this combustible was the same as that of carbon—namely, 14,500 B.t.u. per lb.

It now becomes necessary to derive an expression whereby the percentage of combustible in the refuse can be translated into terms of coal as fired. In deriving this the following notation will be used: Let

R = The total refuse (this is unknown unless determined by weighing);
Y = The percentage of combustible in the refuse;
A = The percentage of ash in the coal as fired;
h = The calorific value of the combustible in the refuse = 14,500 B.t.u. per lb.;
H = The quantity of heat represented by the combustible in the refuse;
X = The percentage loss of coal as fired due to the combustible in the refuse.

If Y equals the percentage of combustible in the refuse, the percentage of ash in the refuse will be $100 - Y$ and the total amount of ash in the refuse will be $R(100 - Y) \div 100$. If it is assumed that dust and cinders are not carried up the stack, all the ash in a given quantity of coal will be found in the ashpit. The ash in the refuse is therefore equal to the ash in the coal, or expressed algebraically, $\frac{R(100 - Y)}{100} = \frac{A}{100} \times$ lb. of coal burned. Transposing this equation, $R = \frac{A \times \text{lb. coal burned}}{(100 - Y)}$. From the foregoing it is evident that the total amount of combustible in the refuse

*Reprinted from "Power."

†Second vice-president, Fuel Engineering Co. of New York.

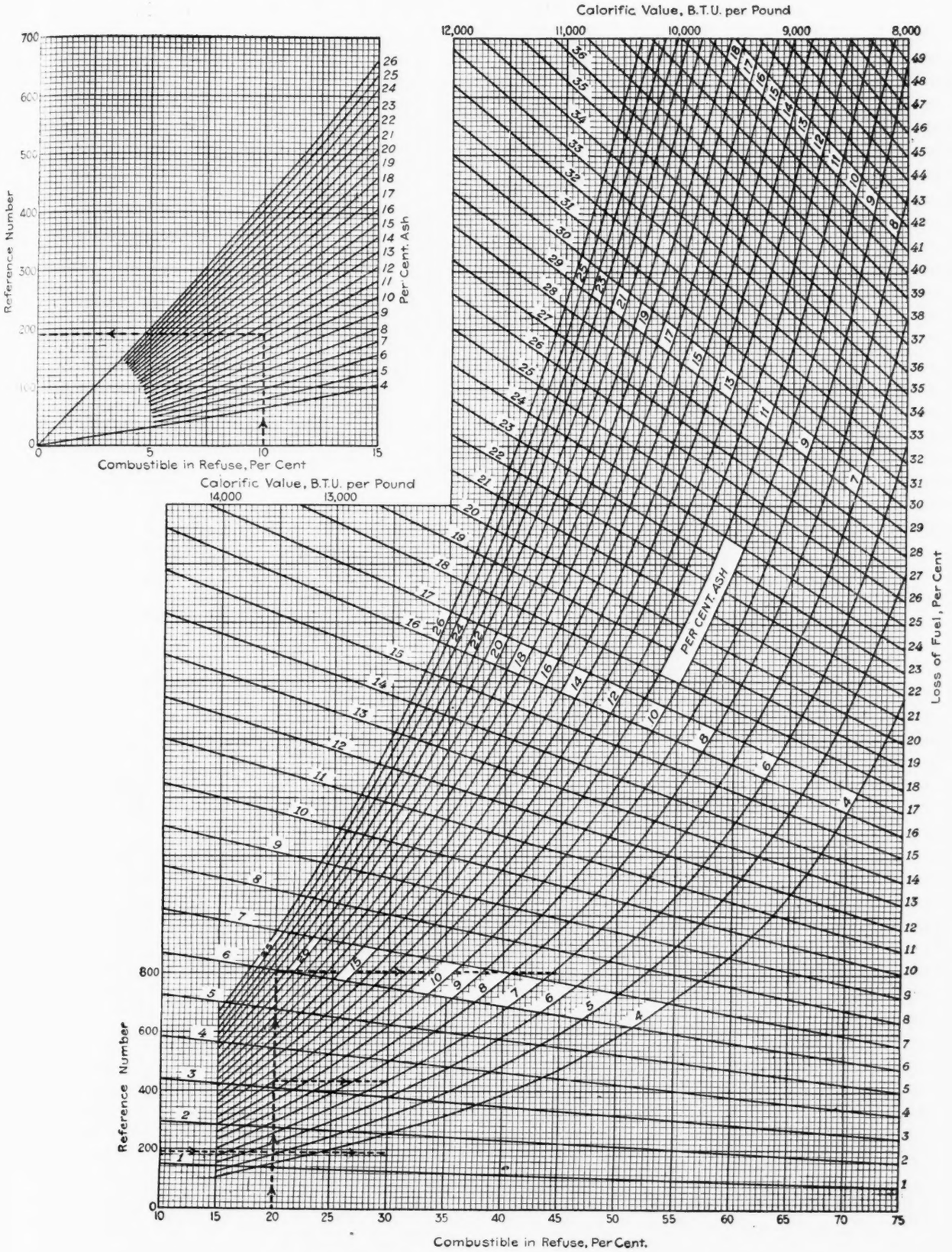


CHART TO DETERMINE LOSS OF COAL THROUGH GRATES

To use the chart with, say, 20 per cent. combustible in the refuse and 12 per cent. ash in the coal that has a heat value of 12,515 B.t.u., start at the bottom at the figure 20, indicating the per cent. of combustible in refuse, and run vertically up to the curved line marked 12 representing the percentage of ash in the coal. Then run horizontally to the right to the vertical line representing 12,515 B.t.u. per lb. The loss is therefore 3.5 per cent. The chart in the upper left-hand corner is used in the same manner. With 10 per cent. combustible in the refuse; coal with a heat value of 12,515 B.t.u. and containing 12 per cent. ash, start at the line 10 and run vertically to the curve 12 and then horizontally to the left. Read the reference number 190 and then using the same reference number on the larger chart run horizontally to the vertical line 12,515 B.t.u. (see bottom dotted line). This point is midway between lines 1 and 2, and represents 1.5 per cent. loss of coal through the grates

is $R \times Y \div 100$; and by substituting in this expression the value of R the total amount of combustible in the refuse $= \frac{A \times \text{lb. coal burned}}{100 - Y} \times \frac{Y}{100} = \frac{A \times Y \times \text{lb. coal burned}}{(100 - Y)100}$.

These terms are determinable from data furnished by the proximate analysis of the coal and a laboratory determination of the percentage of the combustible in the refuse. As the calorific value of this combustible matter is probably the same as that of carbon, the total quantity of heat represented by all the combustible in the refuse may be expressed as,

$$H = \frac{h(A \times Y) \times lb.\ coal\ burned}{100(100 - Y)} =$$

$$\frac{14{,}500(A \times Y) \times lb.\ coal\ burned}{100(100 - Y)} =$$

$$\frac{145(A \times Y) \times lb.\ coal\ burned}{100 - Y}$$

Now H is expressed in B.t.u., and in order to express the amount of coal lost owing to the presence of combustible in the ashpit, it is necessary simply to express the amount of heat H represented by the combustible in the refuse as a percentage of the amount of heat in the coal as fired. This can be done as follows:

$$X = \frac{14{,}500 \times A \times Y \times lb.\ coal\ burned}{(100 - Y) \times B.t.u.\ in\ 1\ lb.\ coal\ fired \times lb.\ coal\ burned}$$

or

$$X = \frac{14{,}500 \times A \times Y}{(100 - Y) \times B.t.u.\ in\ 1\ lb.\ coal\ as\ fired}$$

This last equation makes it evident that the loss of coal increases with an increase of either the percentage of ash in the coal or the percentage of combustible in the refuse, and in both cases the increase is in proportion to some power of the percentage of ash, or the percentage of combustible in the refuse, which power is always greater than unity. This is evident from the fact that an increase in the percentage of ash in the coal not only causes an increase in the numerator, but also causes a decrease in the denominator, because an increase in the ash displaces a like amount of combustible matter from the coal and so reduces its calorific value per pound. From the form in which Y appears in the equation, it is evident that as Y increases, the numerator of the formula increases and the denominator decreases. From these two facts the following deductions may be drawn: (1) With a coal running high in ash, a given percentage of combustible in the refuse represents a larger loss than the same percentage of combustible in the refuse would cause with a coal having a lower ash percentage. (2) With a constant percentage of ash in the coal, the loss increases rapidly as the percentage of combustible in the refuse increases. To make this clear an example is given.

Example: Percentage of ash in coal as fired = 17.21; B.t.u. per lb. in coal as fired = 11,780. What will be the loss of coal when the percentage of combustible in the refuse is 10?

When $Y = 10$,

$$X = \frac{14{,}500 \times 17.21 \times 10}{(100 - 10) \times 11{,}780} = 2.35\ per\ cent.$$

With a percentage of combustible of 20 and 30, the loss of coal will be 5.29 and 9.07 per cent. respectively.

To show how much less important these same percentages of combustible in the refuse would be with coal containing a smaller percentage of ash, the following example is given:

Example: Percentage of ash in coal as fired = 8.64; B.t.u. per lb. in coal as fired = 13,934. What will be the loss of coal when the percentage of combustible in the refuse is 10?

When $Y = 10$,

$$X = \frac{14{,}500 \times 8.64 \times 10}{(100 - 10) \times 13{,}934} = 1\ per\ cent.$$

With a percentage of combustible of 20 and 30, the loss of coal will be 2.24 and 3.85 per cent. respectively.

It is not strictly fair to compare the two examples, as the figures used in the first one are about the average ash and heat found in No. 1 buckwheat and those in the second are about the average for semibituminous coal. These examples show that the percentage of combustible in the refuse is a meaningless figure unless it is taken in connection with the percentage of ash in the coal. To show this more conclusively, the following example is worked out, showing the percentage loss of coal for a given percentage of combustible in the refuse, with two shipments of the same coal having different percentages of ash.

Example: Percentage of ash in coal as fired, delivery No. 1, 12; delivery No. 2, 22; B.t.u. per lb. in coal as fired, delivery No. 1, 12,515; delivery No. 2, 11,030. What will be the loss of coal if each of these coals are burned in such a manner that the combustible in the refuse is 20 per cent.?

Delivery No. 1

$$X = \frac{14{,}500 \times 12 \times 20}{(100 - 20) \times 12{,}515} = 3.48\ per\ cent.$$

Delivery No. 2

$$X = \frac{14{,}500 \times 22 \times 20}{(100 - 20) \times 11{,}030} = 7.23\ per\ cent.$$

These losses are not exactly in proportion to the amounts of ash present in the two coals, and this is only to be expected, for an increase in the amount of ash causes a decrease in the amount of combustible in the coal and consequently a decrease in its calorific value per pound. To state it in another way, the increase in the percentage of ash increases the numerator of the formula and at the same time causes the calorific value of the fuel per pound, which appears in the denominator, to decrease.

The author has had an opportunity to check the working of this formula against the weighing method at a certain plant during 1914 and 1915. All the coal was weighed as fired, and the weight of the ashpit refuse was also determined. All the coal and ashpit refuse was sampled and each week the coal tested for ash, moisture and B.t.u. and the refuse for combustible matter. On the coal-test report is given the loss of coal due to the combustible in the refuse as determined by the formula. The plant determines the loss through the grates by expressing the total weight of the ashpit refuse as a percentage of the total weight of coal fired and subtracting from this percentage the average percentage of ash in the coal as shown by the coal tests. These figures were as follows:

	1914, Per Cent.	1915, Per Cent.
Ashpit refuse, per cent. of coal as fired	17.60	15.90
Percentage of ash in coal as fired	13.49	12.53
Loss of coal through grates	4.11	3.37

The averages of the determinations of loss of coal as made each week from the data supplied by the coal tests and the refuse samples were as follows for the same two years: Loss of coal through grates by formula, for 1914, 4.23 per cent.; for 1915, 3.10 per cent.

If the average of the ash and heat values of the coal tests and the average of the determinations of the percentage of combustible in the refuse for a period of a year be taken and substituted in the formula to determine the coal loss for the year, the result will be quite different from the average of the weekly coal-loss determinations. This would not be so if the coal always had the same amounts of heat and ash and there was always the same percentage of combustible in the refuse, but such a condition is impossible of realization. The reason for the divergence between the average of the weekly coal-loss determinations and the loss computed by using the average values of the ash, B.t.u. and percentage of combustible in the refuse, for the year, is that the law of the loss is an exponential curve and that in different regions the exponent varies widely.

Loss of Coal Determined by Chart

In order to simplify the solution for problems of this sort, this formula has been reduced to the form of a chart (shown herewith) by means of which, if the percentage of ash, the B.t.u. in one pound of coal as fired and the percentage of combustible in the refuse be known, the loss of coal through the grates can be read off directly in percentage.

In the chart vertical lines represent percentages of combustible in the refuse, and also the calorific value per pound of the coal. The lines curving upward to the right represent the percentages of ash in the coal as found by the proximate coal test. The straight lines sloping downward to the right represent the percentages of coal lost through the grates. To solve a problem, start at the bottom of the chart with the value of the percentage of combustible in the refuse, run up vertically to the curved line representing the percentage of ash in the coal, thence run horizontally to the right or left to the vertical line representing the calorific value of the coal per pound. The position of this point relative to the straight lines sloping downward to the right will show the percentage of loss of coal through the grates.

Example: Determine the loss of coal through the grate when the percentage of combustible in the refuse is 20 and the coal has 12 per cent. ash and a heating value of 12,515 B.t.u. per lb. Start at the bottom of the chart at the figure 20, representing the percentage of combustible in the refuse, run vertically up to the curved line marked 12, representing the percentage of ash in the coal, thence run horizontally to the right to the vertical line representing 12,515 B.t.u. per lb. This point is about midway between the straight lines marked 3 and 4, which slope downward to the right and which represent the loss of coal in per cent. The loss would be read as 3.5 per cent.

What is the loss of coal through the grate when the percentage of combustible in the refuse is 20 per cent. and the coal has 22 per cent. ash and a heating value of 11,030 B.t.u. per lb.? Start as before at the bottom of the chart at the figure 20, representing the percentage of combustible in the refuse, run vertically up to the curved line marked 22, representing the percentage of ash in the coal, thence run horizontally to the right to the vertical line representing 11,030 B.t.u. per lb. This point is about one-quarter of the way between the straight lines marked 7 and 8, which slope downward to the right and which represent the loss of coal in per cent. The loss would be read as 7.25 per cent.

These problems are the same as were worked out by the formula in the foregoing. The losses as determined by using the formula were 3.48 per cent. and 7.23 per cent. respectively.

Owing to the difficulty of reading the lines at the lower left-hand corner of the chart, this portion has been drawn to a large scale in the upper left-hand corner. This part is for use where the percentage of combustible in the refuse is less than 15.

Example: What is the loss of coal through the grate when there is 10 per cent. combustible in the refuse, the coal has 12 per cent. ash and a heating value of 12,515 B.t.u.?

Using the large-scale portion in the upper left-hand corner, start at the vertical line representing 10 per cent. of combustible in the refuse, run up vertically to the curved line representing 12 per cent. ash, thence run horizontally to the left and read the reference number at the side of the chart. In this case it is 190. Now drop down to the lower left-hand corner of the chart and, starting at the same reference number, run horizontally to the right to the vertical line representing 12,515 B.t.u. per lb. This point is about midway between the lines marked 1 and 2, which slope downward to the right and which represent the loss of coal in per cent. The loss would be read as 1.5 per cent. By substituting values in the formula, the loss will be found to be 1.54 per cent.

Production in Seventh Pennsylvania Bituminous District

By Charles P. McGregor*

The following tabulation gives the production of the companies in the Seventh Pennsylvania Bituminous District for 1916:

Name of Operator	Coal Output in 1916, Tons
Pittsburgh Coal Co	967,023
Carnegie Coal Co	728,060
Pittsburgh & Eastern Coal Co	434,610
J. H. Sandford Coal Co	281,558
Verner Coal and Coke Co	248,257
Bertha Coal Co	240,720
American Zinc and Chemical Co	237,720
Atlas Coal Co	234,702
Fayette Coal Co	230,864
Pittsburgh & Erie Coal Co	219,000
Bulger Block Coal Co	198,975
W. H. Shinn Coal Co	138,122
P. C. & Y. Coal Co	123,421
McDonald Coal Co	83,130
Greensburg Connellsville Coal and Coke Co	33,955
Fort Pitt Coal and Coke Co	32,755
Hormel Coal Co	26,137
Allegheny County Home	15,921
Hugh McHugh Coal Co	8,297
Williams Coal Co	5,130
Friend & Swartz Coal Co	4,734
D. C. Casey Coal Co	4,278
J. Steele Coal Co	4,000
Cattley Coal Co	3,605
Joseph Walton Coal Co	3,264
Paul Coal Co	3,075
P. Coyle Coal Co	2,130
Midway Coal Co	730
Total	4,513,921
PRODUCTION BY COUNTIES	
Allegheny	1,883,115
Washington	2,630,806
Total	4,513,921

The inside employees numbered 4,742; outside employees, 680; fatal accidents, 10; nonfatal accidents, 125.

*Inspector.

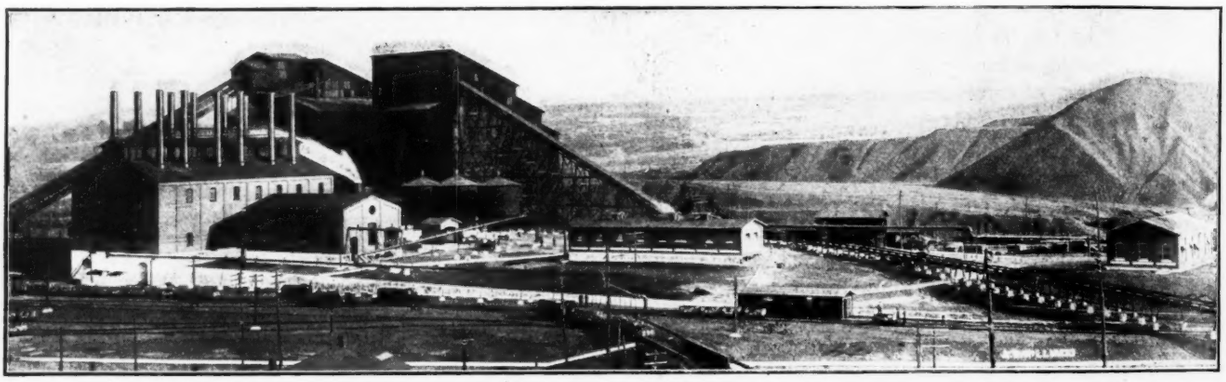
Analysis of Anthracite Trade in Recent Months*

By E. W. Parker†

SYNOPSIS—Some interesting and original data concerning the extraordinary conditions in the anthracite market the past winter. As frequently pointed out in Coal Age, the big storage reserves were the only thing that prevented an acute situation. Increased use of anthracite steam sizes. New England not discriminated against in shipments.

During the last six months there has been something the matter with the coal business. Since the advent of cool weather, when the household demand for coal, and particularly for anthracite, started in, the available supply seemed suddenly to disappear and producers, wholesalers and dealers found themselves faced with a situation that none had foreseen.

Few realize what a complete change occurred in the coal situation. Throughout the greater part of 1915 anthracite was a drug on the market, and during the summer months more coal was sent to the storage yards than at any time previous in the history of the industry. All the yards were taxed beyond their capacity to take care of the surplus produced by the companies, while the individual operators who were not protected by contracts covering their entire production, and who had no storage yards to fall back upon, were hard pressed to dispose of their output even at prices considerably below circular.



NO. 9 COLLIERY OF THE PENNSYLVANIA COAL CO., SCRANTON, PENN.

The Storage Reserves

No exact figures of the quantity of anthracite placed in these storage yards have been compiled, but I estimate that when the cool weather of 1915 came to relieve the situation somewhat, there were between eight and ten million tons of coal in storage. This amount represents nearly 15 per cent. of the total yearly shipments. Some of this was undoubtedly picked up and sent to market in November and December, though in both months the shipments exceeded 6,000,000 tons, and October had made the record for any single month with a total of 6,683,007 tons. During January, February and March both operators and miners were animated by a desire to secure the largest tonnage possible in anticipation of a suspension in case of a disagreement on the wage contracts which were to be renewed on Apr. 1; as a result little additional relief was given to the congested storage yards, and it was estimated that there were still about 7,000,000 tons in stock Apr. 1, 1916. There were also large stocks in the hands of dealers and consumers who had also laid in supplies in anticipation of a possible strike.

If the conditions that have existed since Nov. 1 were abnormal, those prevailing on Apr. 1 were subnormal. So acute did this situation become that I was requested to take a trip through Ohio, which had at one time been a fairly good market for anthracite, but from which that fuel had been largely eliminated by natural gas. The local supplies of gas, however, had been showing pronounced evidences of approaching exhaustion and it seemed a good opportunity to start an anthracite propaganda in that state. I spent a month on this trip and in addition to studying the changing conditions there, placed a considerable amount of advertising in the daily newspapers of the medium sized towns. This advertising was kept up for about three months with satisfactory results in some ways, but it was found necessary to discontinue it rather abruptly when the conditions in the Eastern markets changed so suddenly and unexpectedly. No one anticipated such an entire revolution in the anthracite situation.

Cost of Storing Coal

During the time we were conducting this advertising campaign in Ohio, we were also issuing occasional bulletins to the daily press urging consumers to take advantage of the spring and summer discounts and lay in their supplies before the advent of cold weather. This was not because any shortage was anticipated, but was done for the double purpose of taking care of the summer production and securing the movement to market of some of the storage coal.

Operators do not store coal because they like to, as it costs money in several ways. The cost of production and the freight charges have been paid in cash, and there is a loss in degradation due to breakage in rehandling and an additional labor cost in discharging and reloading.

*Abstract from a paper presented at the recent meeting of the New England Coal Dealers' Association, Boston, Mass.

†Director, Anthracite Bureau of Information, Wilkes-Barre, Penn.

The money tied up in 8,000,000 tons of storage coal would be not less than $30,000,000, the interest on which at 4 per cent. would amount to $100,000 a month, while the expense of rehandling and loss in degradation add about 10 per cent. more to the cost of the coal. These are what the operators pay for maintaining storage yards whose chief purpose is to establish a balance between the supply and demand of the prepared or domestic and the steam sizes; the supply of the former is usually in excess during the summer; in winter the reverse is true.

When the shortage developed in the early winter of 1916, the anthracite operators were accused by some of the newspapers of having conducted the advertising and "buy-early" campaign during the summer for the purpose of creating a panic, and also of withholding shipments in order to victimize the public through high prices. Such charges are shamefully unjust, for I venture to state that for at least 90 per cent. of the domestic sizes of anthracite sent to market in 1916, the prices have not been advanced over the circular announced in May after the increase in cost due to the new wage agreement had been determined; I also venture the further assertion that the margins between the cost of production and the selling prices of the domestic sizes of anthracite in 1916 were less than in any of the three preceding years.

NO. 4 BREAKER OF KINGSTON COAL CO., KINGSTON, PENN.

The Extraordinary Consumption the Past Winter

The question one hears on every side is: What is the reason for the shortage in anthracite, and how is the situation to be relieved? I must confess my inability to give an answer to this question, but I can give some facts that are of interest in this connection.

Notwithstanding the unprecedented shortage of labor in the anthracite region in 1916, the production was maintained at a rate equal to 99 per cent. of that of 1915 and a little over 96 per cent. of that of 1911, when the maximum output in the history of the region was obtained. The shipments in 1916 amounted to 67,376,364 tons, against 67,883,776 tons in 1915, the decrease in the latter year being only a little more than 500,000 tons. I have already referred to the quantity of coal in storage on Apr. 1, 1916, as estimated at about 7,000,000 tons, the excess accumulated in the preceding two poor years for anthracite. All this coal was picked up and sent to market in 1916, so that the total quantity marketed, exclusive of that sold locally, was in the neighborhood of 74,000,000 tons, a figure not approached in any previous year by as much as 4,000,000 tons.

Many consumers of anthracite undoubtedly took the advice so freely offered them in the spring and summer of 1916 and did lay in their supplies in advance, and that this buying depleted somewhat the stocks of dealers, who were not prepared later to meet the demands of those consumers who from lack of foresight, credit, cash, bin capacity, or any other reason, had not provided themselves in time. From what I have been able to learn there was much more coal in the cellars of consumers at the beginning of the present winter than is usually the case. This would not account for the entire shortage, however. How much if any more anthracite went into Ohio as a result of the advertising campaign I am unable to say. I do know that the demand from there has been vigorous and insistent, for the failure of the gas supply was pronounced.

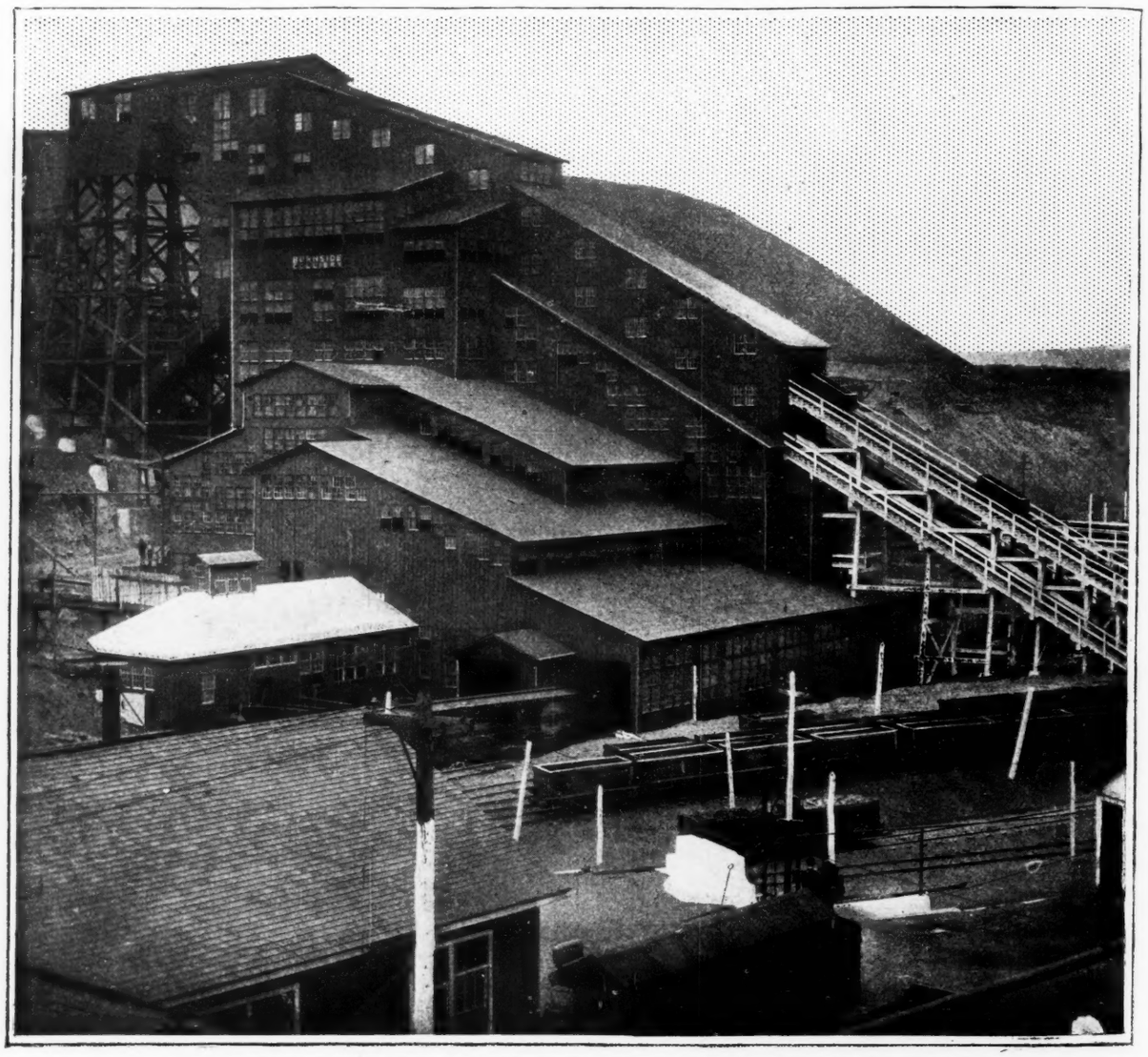
A considerable quantity of the prepared sizes of anthracite has been taken by industrial establishments accustomed to the use of bituminous coal and coke. In the latter fuel there has been an even more strongly marked shortage than in the supply of anthracite. It has been as difficult to get and to keep laborers at the coke ovens. So scarce and so high-priced has labor been in the coke regions, and the demand for bituminous coal at good prices has been so active, that operators have found it more profitable to sell their coal raw.

Users of coke in the East who have not been able to get all of that fuel they needed have had to resort to anthracite. Such users, however, would probably require broken or steamboat coal rather than the prepared sizes, and should not affect these were it not for the fact that it reduced the quantity of large coal to be broken down into the domestic sizes.

The scarcity of bituminous coal for steam purposes in the Eastern markets, due to the demands by munition plants and other manufacturing establishments, has naturally resulted in an increased demand for the steam sizes of anthracite. Moreover, steam users have been gradually awakening to the great value of anthracite small sizes as steam producers, and these once despised products of the anthracite breakers have been in such demand during the past winter that the supply has not been sufficient to meet it. Consumers accustomed to using the small sizes have been compelled in many cases to resort to the higher priced domestic sizes. To this probably more than to any other one cause may be attributed the shortage in the domestic sizes of anthracite.

The Case of Discrimination Against New England

There have been complaints that New England is discriminated against in the distribution of anthracite. This is disproved in a recent report of the United States Geological Survey which contains some interesting figures on the production, distribution and consumption of coal, both anthracite and bituminous, for the calendar year 1915. The only other official figures of the same character that are available are for 1905. Comparisons of these statements show that in the ten years the total production of anthracite has increased from 69,339,152 to 79,459,876 tons.[1]



THE PHILADELPHIA COAL AND IRON CO.'S BURNSIDE COLLIERY, SHAMOKIN, PENN.

[1]Bituminous production in the same time increased from 281,000,000 tons to 395,000,000 tons, or about 40 per cent.

The principal markets for anthracite are naturally in Pennsylvania, New York and New Jersey, which combined absorb over 60 per cent. of the total shipments. In spite of the increased production, the shipments to these naturally tributary markets in the ten years from 1905 to 1915 decreased from 41,500,000 tons to 41,070,000 tons, while the shipments to New England have increased from 8,693,000 tons to 12,137,000 tons.

It is too early as yet to obtain any figures regarding the total shipments to New England for 1916, but I learn from Mr. Coffin, Secretary of the Fuel Committee of the Boston Chamber of Commerce, that the quantity of anthracite received in Boston last year was 1,966,314 tons, against 1,906,690 tons in 1915. There has been a notable decrease in the shipments of anthracite to New England ports from New York by water, but this is a condition for which anthracite operators are not to blame.

The act of Congress bearing on the regulation of traffic through the Panama Canal stipulated that no rail transportation company should also engage or be directly in-

STEEL TRESTLE AT THE BUTLER COLLIERY

terested in the transportation of freight or passengers by water. It may be difficult to see where the transportation of anthracite from New York harbor to Long Island Sound and New England Atlantic ports had any bearing upon the transcontinental traffic through the Panama Canal, but there was no discrimination in the law and the railroad companies operating barge lines from New York to New England were advised by consul to dispose of them. The result, according to a statement from one of the high officials of the Delaware, Lackawanna & Western R.R., which was one of the transportation lines affected was as follows: This company operated a number of barges on a delivered price, the water-bearing portion of which from New York to various New England ports was from 40 to 65c. a ton. The railroad company sold its barges, as it was advised to do by its attorneys; the barges are now in private ownership and I understand that the people of New England are paying from $1.50 to $2.50 a ton freight on coal for which they formerly paid from 40 to 65c. Moreover, with the disposition of its barges the Lackawanna R.R. withdrew from the New England market. It had, I understand, no through connections with other rail carriers and with the disposition of its barges it gave up its New England trade. When the citizens of Providence wanted to know why prices for anthracite had advanced more there than at some interior points they found out.

[Further abstracts of this paper, treating with other problems in the anthracite coal industry, will appear in later issues of *Coal Age*.—Editor.]

Recollections of a Manager

My wife, while reading her favorite magazine one day, came upon the statement that "the successful men of the world are those who are able to interpret public opinion." The sentence was part of the advertisement of a correspondence school that promised to make "captains of industry" out of any and all who would enroll. The whole advertisement was so convincing that no one would question it for a moment. Mrs. Thompson, in fact, was so impressed that she could not wait until evening to tell me about it, but came rushing down to the office.

For several months prior to this, we had been having rather heated discussions at home over the size of my wife's allowance; and we had finally come to the conclusion that we would have to give up trying to keep pace with the way some of our neighbors spent their money, in spite of the fact that we felt that my position with the company demanded that we meet certain social obligations.

The correspondence school's advertisement had put two ideas in my wife's head: First, that I was not a successful man in the fullest sense of the word (my failure to provide a larger allowance was probably responsible for that) and second, that I could be successful if I would only pay more attention to public opinion.

A short while before my wife's visit to the office I had been closeted with a committee of citizens who had come to protest to me (I am the most accessible representative of our company) against the manner in which we had ignored the provisions of the state's child labor laws. How did they know we were indifferent to the provisions of the law? They were quoting public opinion on the matter.

The day before a committee had waited on me to protest against the price of coal to the ultimate consumer. How did they know the producers of coal were the real offenders in the price-boosting game? They were quoting public opinion.

Two days before that, a committee of citizens had visited my office to suggest that unless our company voluntarily increased its tax assessment to a point where the city could realize about twice the present tax revenue from us, the Governor would be requested soon to appoint a special investigating committee. How did they know we were not already bearing our full share of the tax burden? They were listening to public clamor.

The time was certainly not opportune for any one to try and convince me of the inspiration to be derived from feeling the pulse of public opinion. It is doubtful, even, if the writer of the advertisement in question could have aroused my enthusiasm had he appeared in person instead of being represented only by a recent convert. At any rate I didn't enthuse, and I couldn't even make my wife understand that I appreciated her efforts although I questioned her judgment. Finally, as a last resort, I recalled for her benefit the verdict that public opinion passed upon me some years before, when I was still a mine superintendent; it decided that all our mine guards were thugs and murderers, and that I was deserving of a prison sentence because I refused to discharge them. Three of them, a few days before that, had saved Mrs. Thompson and our children from the fury of a mob that planned to burn the superintendent's residence.

Without further discussion Mrs. Thompson destroyed the application blank for the course that she had carefully cut out of the magazine.

The Labor Situation

General Labor Review

The umpire of the Conciliation Board has made an important decision covering a number of workmen. It assures those men whose time is not decreased from 9 to 8 hours of an increase in pay over the old contract of 7 instead of 3 per cent., which is all many of them have been getting. It also will result in their getting back pay. The ruling was made in the complaint of Thomas Thomas, footman, and James Burns and Joseph Alexander, boiler tenders, at the Leggitts Creek colliery of the Delaware & Hudson Co.

In the northern coal field the Moosic Mountain Coal Co.'s miners have been on strike for some weeks because of a difference with the docking boss, who they thought had been unjust in docking their coal. Over 800 were idle. The district board of the United Mine Workers of America succeeded in getting the matter settled. The men were promised by Superintendent Charles P. Ford that the utmost care would be taken to see the dockages were fair in future. At Pittston the Pennsylvania Coal Co., the Hillside Coal and Iron Co. and the Lehigh Valley Coal Co. reduced their price for coal delivered to employees from $3.75 to $3.50 per ton for prepared sizes and from $2.60 to $2.50 per ton for pea coal.

Plymouth Firemen Say They Are Overworked

The employees at No. 3 colliery of the Delaware & Hudson Co. at Plymouth are complaining about several conditions which they regard as grievances. Three firemen were formerly employed on each of the three 8-hour shifts and two ash wheelers on the two night shifts. Recently a change was made and a fireman was dropped from each of the two night shifts and all the ash wheelers were laid off. The firemen allege that they always had all they could do and that the reduction in force made their duties too onerous.

They are not striking, but are waiting until the grievance committee can settle another point of difference, which is as follows: Eight miners in the Bennett mine complain that they are getting $1.04 per car and should get $1.14, the rate paid the miners working in the other veins. The miners apparently do not know of the existence of a Conciliation Board before which such matters must be brought.

Miners Do Not Favor New Roderick Mine Code

The mine workers are apparently no better satisfied with the new Roderick mine code than the operators. They do not regard his assertion that accidents will be decreased by its enactment by 50 per cent. as any more than a boast that cannot be substantiated in actual practice. The mine workers even say that the code will increase rather than diminish accidents, and that it imposes regulations upon the operators which are unnecessary and from which no good would result.

The miners at Eriton, near Du Bois, at the western end of Clearfield County, went back to work on Wednesday, Mar. 21, a settlement having been effected with the Northwestern Mining and Exchange Co., the operating corporation.

Adrian Drivers Seek To Compel Shorter Day

A settlement at the Adrian and Eleanora mines is still far off. The demand of the Adrian mine workers that drivers be paid from the time they leave the barn till they get back to it is an impudent attempt to write a new contract without a new condition arising. The drivers may contend that it is just as much work to take a mule to and from work as to drive him with a string of cars behind.

Perhaps it is; perhaps the method of payment of drivers is all wring; but what appears on the face of the contract is binding, and the drivers cannot escape from it, nor any of the other employees. Rule 27 is quite specific: "Eight hours of actual work at place of work shall constitute a day's work for all labor inside the mines, except pumpmen and monthly men, who shall work the number of hours required." It could not be written any more plainly.

It may be somewhat unfair when the mines are large and the stable located a long way from the working face, but the two-year contract calls for it and conditions have not materially changed, and surely the contract should stand.

Another grievance of the Adrian men has a more reasonable look. Some companies, like the Rochester & Pittsburgh Coal and Iron Co., are mining the Freeport measure, which has a bad roof. Some of these companies have been giving the miners a machine and thereafter have credited them with only machine rates for mining. The roof is often too bad to make it safe to withdraw pillars, so the miner who mines his pillar coal by pick or with powder gets only machine prices.

Sulking Employees Should Arbitrate Claim

The coal is thick, the pillar coal is easily mined, and he overlooks the method by which the company has circumvented the scale. Now the company at Adrian may be doing none of these things, but, according to B. M. Clark, the attorney and vice president of the company, the men want hand rates for pillar coal. Of course, the matter should be arbitrated and determined according to the contract. Perhaps the company is not doing as alleged; perhaps the condition of the roof would really justify the miner in drawing his ribs by machine mining, as is done in many places in the Lower Kittanning bed. Arbitration would determine the truth. A strike, or a "sulk," shall we call it, is not the way to right the matter.

The Eleanora men are out because two or three men will not join the union. The men in question say they have conscientious scruples against taking the oath prescribed by the United Mine Workers of America. It is needless to say that the button strike is as great an offense under the central Pennsylvania contract as under that in force in the anthracite region.

The drivers are entitled under their contract to $2.77 per day and are getting $3.05 per day by reason of the bonus. The cutters and loaders with the bonus considered are getting from $4.50 to $6 per day. All the outside men had their wages raised in October of last year. So no one is entitled to much commiseration and the company is determined that the mine workers shall answer in the courts for their "sulk," which is a plain violation of a contract that the company contends has full force in law.

Central Pennsylvania Seeks a Second Bonus

On Monday, Mar. 26, 190 delegates, representing the 40,000 mine workers of District No. 2, central Pennsylvania, assembled in Du Bois in a special convention called by over 60 locals. The mine workers who are getting a bonus of 10 per cent. above the wage granted them on Apr. 1, 1916, with the stipulation that it should last till Apr. 1, 1918, still want a big increase.

This demand is the more dishonorable because the central Pennsylvania miners are the only union men who have as yet received a bonus or wage increase, except a small number of men in central West Virginia. The central Pennsylvania mine workers, of all the employees of coal companies in the United States, have the least right to make complaint about their wage scale.

The demand for the abolition of car pushing is another most discreditable claim. One for the doing away with the standard weight must meet with more approval. It is to be regretted that John F. Forsythe, the secretary of the Coal Operators Association of Central Pennsylvania, has already declared that the standard weight will be maintained by the operators despite all opposition from the mine workers. He says: "Our organization has decided to stand pat on the 1916 scale agreement, and we shall not abolish the standard-weight rule from the mines, nor shall we grant an additional 10 per cent. bonus to the miners. The operators insist that the miners live up to the agreement signed last year, and no changes shall be made until the time to sign another agreement arrives. We shall concede absolutely nothing further than we have."

The persistence of the mine workers in central Pennsylvania puts the operators out of patience with their demands. They could at least wait on the action of the central competitive district, which has not yet received the 10 per cent. Even then they have absolutely no right to demand an increased wage, however well it may be for the operators to grant it to them.

President John P. White, of Indianapolis, telegraphed to the convention urging that there be no factional strife. He added: "Above all, I hope your convention will go on record for the maintenance of your agreement with the operators."

James Purcell, the president of District No. 2, recently resigned, his resignation to take effect Mar. 22. His term of office would not have expired till Apr. 1, at which time John

Brophy would have succeeded him. His resignation automatically results in Charles O'Neill, the vice president, becoming acting president of the central Pennsylvania organization.

At the mines in and around Portage, in Cambria County, the strike over the standard weight continues. At a meeting on Mar. 16 the operators offered to remove the standard-weight provision as far as it related to the heaviest type of car, but the miners rejected the offer.

The Pittsburgh district is comparatively quiet as far as labor troubles are concerned. No demand has been made for increased wages, though at the recent Charleroi meeting the officials were requested to make a demand. Probably the workmen are awaiting the action at Indianapolis, Ind., where the mine workers' international officials are meeting, and are hoping to induce the operators of the central competitive district to arrange a meeting with them.

Cornell Coal Co. Seeks an Injunction

The application of the Cornell Coal Co. for an injunction against the United Mine Workers of America, and particularly Local No. 428, was heard on Mar. 16 in the Common Pleas Court of Allegheny County before Judge Evans. About eight witnesses were subpœnaed. The decision of the court will be announced later.

The "Labor Tribune" of Pittsburgh, which is said to favor the operators, declares that the Cornell and McFetridge coal companies are paying more than union wages, are furnishing free powder and paying liberal bonuses. It declares that there is one organizer to 10 men, and that the agitation is in no way justified.

A wage contract has been prepared by the subjoint scale committee appointed by the United Mine Workers of America, District 17, and the operators of the Kanawha field. The general joint committee ratified the instrument. A joint convention of miners and operators was held Friday, Mar. 30, to complete the agreement.

Increase of 27 per Cent. with Shorter Day

The terms of the agreement are: An increase of 6½c. per ton for all coal mined, the weight to be measured on the run-of-mine basis. The increase is said to average 20 per cent. An 8-hour workday. Full and complete recognition of the union, and closed shop in the Kanawha district. The rate per day for day labor to be 27 per cent. more for an 8-hour day than was formerly paid for a 9-hour day. A commission to adjust existing inequalities, which commission will report to the next wage conference, to be held shortly before the termination of the new contract late in 1918. The contract to last from Apr. 1, 1917, till Dec. 31, 1918.

The meeting was conducted in the best of good humor. The wage increase is unusually large and the change in terms quite sweeping.

The Ohio mine workers are outspoken for an increase in wages. Representatives of the mine workers of eastern Ohio to the number of about 100 met at Wheeling, W. Va., on Mar. 13 and commented favorably on the fact that the operators in a meeting at Columbus the week before had virtually admitted that they were willing to grant a higher wage if other parts of the central competitive field would do the same. President Roy urged closer relationship with the mine owners in order to secure better laws. Vice President Ledvinka found fault with machine men, who, he said, were in some cases working more than 8 hours, despite the fact that the 8-hour contract had been obtained after much expense and negotiation.

The Hocking Valley district met at Glouster Mar. 21 to put in operation ways and means for getting an increase in wage. But it seems that the sense of duty prevailed and plans made were laid merely for effective action when the present contract comes to an end.

Ohio Miners Seek Central Pennsylvania Bonus

These meetings were followed by another at Columbus on Mar. 20, at which both coal operators and union officials were present. All those in attendance agreed to try and secure a joint meeting of the mine workers and operators of the central competitive district to the end that an increase of 10 per cent. might be granted on last year's scale.

The central Pennsylvania miners should keep that fact in mind. Ohio is asking for what central Pennsylvania has received, yet central Pennsylvania is still not satisfied. District 2 would be quite well justified in correcting "ways that are dark and tricks that are vain," such as the standard weight and the machine rate for hand-mined coal may well be, but it wants too much when it demands a second bonus before others have a first as well as the abolition of car pushing and shorter hours for drivers.

At the meeting of the Indiana Bituminous Coal Operators Association held Wednesday, Mar. 14, the members discussed the demand for an increase in wage which has been considered at the meetings of several local unions. At many of these gatherings the district officers had been urged to call a special meeting to demand more pay for the mine workers.

The operators took no action, but the discussion made evident the fact that the operators were opposed to taking part in any movement to abrogate the interstate joint agreement. The management of the association that will have to deal with the mine workers' demands is of interest. Will J. Freeman, secretary and treasurer of the Glen Ayr Coal Co., is reëlected president. M. J. Gould succeeds himself in the vice presidency and Phil Penna is still secretary and treasurer. The executive committee consists of 15 operators: David Ingle, William Zellar, E. G. Logsdon, J. H. McClelland, John T. Conners, Hugh Shirkie, James Moore, A. M. Ogle, J. C. Kolsem, John Hewitt, Homer B. Talley, J. A. Templeton, George H. Richards, H. M. Ferguson and J. K. Dering.

At the headquarters of the United Mine Workers in Indianapolis, Ind., a meeting was held on Mar. 19 by the leading mine workers' officials to discuss the demand for an increase in wages. Philip Murray, president of the Pittsburgh district; John Moore, president of the Ohio district; Frank Farrington, president of the Illinois district, and Edward Stewart, president of the Indiana "bituminous" district, were all present.

District Presidents Are Loyal to Scale

Thus the central competitive district was well represented. Only the "block" coal district of Indiana seems to have been without representation if the list of presidents named is complete. As a result of the meeting Robert R. Gibbons, vice president of District No. 5, the Pittsburgh district, gave out the following statement:

> The mine workers are operating under agreements they are bound to respect. Today's meeting has no notion of attempting to abrogate those agreements, but to devise ways, if possible, so that, by mutual agreement between the miners and the operators, something may be done in the way of a temporary increase in wages, or a temporary bonus, to relieve the situation brought upon the mine workers by the great increase in the cost of living.

The declaration thus made is highly creditable to the United Mine Workers. They ought to get the increase in wage for which they are seeking.

Operators Promise Alabama Miners a Bonus

Most of the coal operators of Alabama are planning to give a bonus to their employees, according to James L. Davidson, secretary of the Alabama Coal Operators' Association.

At the Wilder mines, near Lebanon, Va., the tipple master, the script clerk and nine miners were charged with conspiracy to defraud the company. They sought to have more coal credited to the nine miners than was actually delivered to the tipple. The miners were convicted and fined $50 each and 30 days in jail. The tipple master and script clerk have not yet been tried.

John R. Lawson, former president of District 15, now under sentence of life imprisonment for murder in the recent southern Colorado labor war, but out on bond pending an appeal to the Colorado Supreme Court, has commenced work as an ordinary miner at a private mine near Frederick, Weld County, in northern Colorado. He has not worked at his trade for 12 years.

Canadian Settlement Has To Be Made Over

One can but feel sympathy for the Canadian operators in District 18 of the United Mine Workers of America. Like our anthracite operators contending with the courts, these Canadians are becoming more of lawyers than operators. They are always having to argue their case. In the middle of February they made an agreement with their mine workers by which they modified a second time the still operative agreement of Mar. 31, 1915. The contract had only to run to Mar. 31 of this year, and so one agreement was no sooner signed than another must be written. The operators claim that the 9½ per cent. increase given in the middle of February was awarded to the mine workers because of an increase in the cost of living, which was seasonal. Winter prices are always higher than summer prices. Consequently the operators do not want the 9½ per cent. retained. They are willing to give a 5 per cent. increase and to retain the war bonus of from 5 to 12½ per cent. till the war is over, but the 9½ per cent. they declare they will not grant; 5 per cent. is enough. T. W. Crothers, the Minister of Labor, had barely got back to Ottawa when he had to return and take the train to Calgary and work at the matter again. The working conditions are apparently settled, but the wage question still hangs uncertainly. The miners have agreed to the mutual fund and forfeiture provisions to become operative in case of a violation of the agreement. The argument still continues, however, about the wage, and it is feared that a strike will occur.

Rate Sheets May Be Questioned

Certain employees at the Nesquehoning colliery of the Lehigh Coal and Navigation Co. recently brought a grievance before the Board of Conciliation. It appears that they desired pay which, on its face, accorded with the rate sheet of the colliery. In actual practice, however, the price demanded had never been paid, and there was good reason why it should not be. The case was deadlocked when the board considered it, and it had to be submitted to the umpire, Charles P. Neill. He decided that the rate sheets were not absolutely unquestionable and that a rate that has been in effect and recognized as standard is to be accepted whether it appears upon the rate sheet or not.

The men's complaint was, that having been ordered at the Nesquehoning colliery to drive chutes with a 5-ft. collar and a 6-ft. leg they had not been paid according to the official rate sheet, a copy of which was filed with the Conciliation Board. This read: "Chutes 5 ft. by 6 ft., timbered, old rate, $5.29; new rate, $5.82."

The men complained, and their statement was practically conceded by the company, that they were not paid $5.82, but only $3.88 per yard. It was shown by the company, however, that the general rule in effect at the colliery was to pay the standard rate of $5.82 only for driving in the solid, and that when the chute was driven along a former opening, such as a manway, and was practically an enlargement of such an opening, it was customary to pay two-thirds of the standard rate, or $3.88.

In rendering his decision the umpire stated that as he had held in former cases, "the rate sheet does not create a new rate, but merely records rates that were actually and properly in existence when the rate sheet was prepared. The fact that a rate appears on the rate sheet does create a prima facie case in favor of that rate. In the same way the absence of any rates from the rate sheet makes a prima facie case against such rate. If it is claimed by the company that a rate appearing on the rate sheet is wrong, or that a rate not on the rate sheet is an existing rate, the burden of proof lies on the company to demonstrate convincingly either that a wrong rate was entered on the rate sheet, or that a proper rate was omitted from it."

The Two-Thirds Rate Was an Old Institution

Five witnesses for the company testified and they, in the judgment of the umpire, showed conclusively that the two-thirds rate was the rate in existence prior to 1902 and it was still the existing standard rate in 1912, though it had failed to be recorded on the rate sheets when they were prepared for that year. Though two witnesses for the complaining miners testified that they had been paid the rate of $5.82 when driving chutes along an old manway, the umpire accepted the testimony of the witnesses for the company that when the full rate was paid it was in exceptional cases for chutes driven along former openings and was merely given as an allowance to make up wages.

The umpire calls particular attention to the fact that the company compiled as an exhibit a statement of over 40 pages showing several hundred instances in which the two-thirds rate was paid for driving chutes, crosscuts and airways, and that this two-thirds rate began in 1900 and was carried down to the end of December, 1915. This, in the judgment of the umpire, conclusively disposed of the contention that these two-thirds payments were unjustifiable and improper and possible only in individual cases where men were ignorant of the proper rate.

The umpire accordingly held that the company had fully and conclusively established its contention that the two-thirds rate was an established rate at the colliery, going back even prior to the date of the award of the Anthracite Strike Commission, and the grievance therefore was not sustained.

Wages and the Cost of Living

The steadfastness with which the international officers of the United Mine Workers and all the district presidents, vice presidents and secretaries in the United States have stood by the present wage scale is highly creditable to them. That they have been able to do so and have not been maligned by the mine workers for so doing shows that the greater part of the union men realize their duty and that most of them are ready to continue to work for a wage based on a condition which has radically changed since the contract was signed.

The conservatism and good faith that the workingmen are exhibiting seem to place upon the operator the duty of being equally generous and honorable. He cannot in honor be compelled to increase wages to meet living conditions in the face of his contract, but he should do of his own volition that which without a breach of faith he cannot be made to do. The rule that wages shall rise soon after every increase in the cost of living should be followed faithfully. Not even a contract should be allowed to interfere with this principle, the correct base of all dealings between capital and labor.

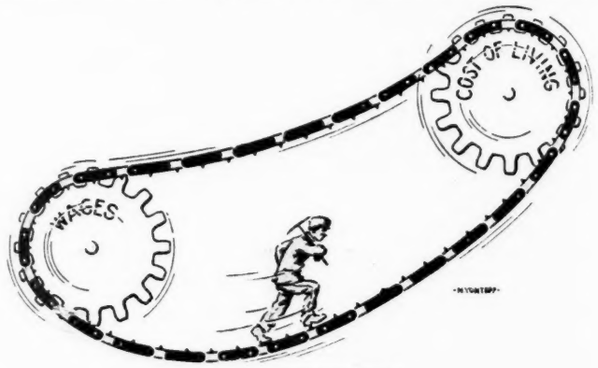
Small adjustments should not, of course, be made while wage contracts are operative or while trade contracts continue in force, but when sweeping changes take place the operator who realizes the importance of those changes should not be slow to accommodate his wage roll to meet them.

We firmly believe that the bituminous coal operators of the United States wish to do better by their mine workers. They do not want to see them impoverished by the increasing cost of living. Especially do they feel a genial interest in their men at this time, when the operators, capital generally and a large proportion of the workmen, other than theirs, are doing well. The operators, it is well known, are waiting for one another. But in this connection we must not overlook the fact that a good start has already been made at several points. Central Pennsylvania has spoken; so have the Rockefeller interests in Pennsylvania, West Virginia and Maryland; so also have the United States Steel Corporation affiliations in the Pittsburgh district, and with them the whole Connellsville region. The Kanawha region, not having a contract, has just recently made large concessions to secure one. So the time is ripe for changes wherever they have not been already made.

It is true there are many new contracts to be met and a few old ones still remaining, but the new contracts are at amply high figures, and surely some of the old ones could be modified for so worthy an object. It is at least worth a trial. But whether that can be done or not, there is enough new business at high figures to justify an increase in wages in view of the rising costs of living.

Such a generous consideration of the mine workers' needs would give them confidence in the essential uprightness of the operator. It would give him a power in future negotiations of which a niggardliness at the present moment would in the future deprive him.

The illustration, "Getting Nowhere," exhibits clearly the dependence between wages and the cost of living. One wheel revolves as fast as the other. The workman is shown getting nowhere. He cannot get anywhere unless he has a greater



GETTING NOWHERE

productivity. That is the crux of the whole situation. Changes in wages merely involve changes in cost of living, unless the workman can give more product to other workmen in exchange for his wages. The argument is one for greater regularity in work, less waste in foolish expenditures and close scheming, so that every blow will count and be supplemented by the power of well-contrived machinery. The pay of a man arises from what he produces, and workmen as a whole can never receive more if it is not made possible for them to do more. There are too many strikes and too many idle days. For these everyone is to blame. There is need for a commission of business men, not necessarily or preferably governmental, to inquire just how strikes and idle days can be eliminated. That the matter has been attacked wrongly is evident. The solution of the problem is one which should be given the most careful consideration.

We talk glibly about this "wicked war," but we have not yet arranged matters by which industrial war even is mitigated. If a man wants an increase of wage to meet an increase of cost of living, we give it to him only after a strike or a long period of heated negotiation. We should go out to meet him. His wage should be a matter of careful deliberation. He should feel that he can neglect his own defense because the operator is prepared to correctly assess and grant him whatever his rights are. Instead of that, the workman knows that what he gets is what he fights for. No wonder he is always fighting.

Barricading Against Afterdamp

Van H. Manning, director of the Bureau of Mines, on Feb. 24 addressed a letter to the *United Mine Workers Journal*, from which the following is an excerpt:

Within the last two years quite a number of miners who have been entombed in mines by explosions have saved their lives through having the good sense to barricade themselves in the mine and wait patiently until they were rescued.

The Bureau of Mines has all along recommended this procedure as against the old method of rushing headlong through the entries toward a place of supposed escape. The old method has been responsible for a great number of deaths. In fact, it has been a common occurrence for our rescuers to find in the entries, bodies of men who had endeavored to leave the mine.

The most recent example of the efficacy of such recommendations was seen at an explosion at the mine of the Oliphant-Johnson Coal Co., Bruceville, Ind., Dec. 19, 1916, in which two men were killed and 24 severely burned. As to just what happened here, I will quote from one of the engineers of the bureau who was present:

"The main east section was not damaged by the explosion, but outby the ventilation was destroyed and dense smoke filled the entries. Forty-two men in this section saved themselves by erecting barricades. One party of 17 men erected a barricade of gob in room No. 1 off the second north panel entry. Some of these men had attempted to get out, but were forced to turn back. The second group of 25 men made two attempts to get out and then retreated and erected three board stoppings at the mouths of panel entries near the face of the main east section. A door between the main air course and the main entry was propped open to short-circuit the air as a protection against its possible reversal during the restoration of ventilation.

"About three hours later, when the air had sufficiently cleared, the 42 men were rescued by men without rescue apparatus. The group of 17 men had restricted themselves to a space of about 100 cu.ft., so that the air they had isolated would not have lasted very long. The 25 men had possibly 1800 ft. of double entry with good air. However, these entries became completely filled with methane in about 24 hours, showing that the men would have been suffocated if an early rescue had not been effected.

"Each group of men was led in the work of erecting barricades by members of the Oliphant-Johnson Coal Co.'s first-aid team, trained by Bureau of Mines men, which team won first place at the Bicknell, Ind., state-wide first-aid meet, October, 1915. These two men were also members of the 1916 team, which received Bureau of Mines training, and so also was the man who located and brought out the survivors."

COMING MEETINGS

Illinois Mining Institute will hold its next meeting on May 17, 18 and 19, at La Salle, Ill. Secretary, Martin Bolt, Springfield, Ill.

American Society for Testing Materials will hold its annual meeting June 26-30 at Atlantic City, N. J., with headquarters at Traymore Hotel.

International Railway Fuel Association will hold its annual meeting May 14-17 at the Hotel Sherman, Chicago, Ill. Secretary, J. G. Crawford, Chicago, Ill.

American Society of Mechanical Engineers will hold its spring meeting May 21-24 at Cincinnati, Ohio. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

American Chemical Society will hold its spring meeting Apr. 10-14 at Kansas City, Mo., with headquarters at Hotel Muehlbach. Secretary, Charles L. Parsons, Washington, D. C.

Mine Inspectors' Institute of the United States of America will hold its tenth annual meeting July 10-13 at Indianapolis, Ind. Secretary, J. W. Paul, Empire Building, Pittsburgh, Penn.

PLAIN ENOUGH

By BERTON BRALEY

Written expressly for Coal Age

When the prehistoric caveman lived and struggled, long ago,
He was strong for independence as he wandered to and fro,
If he had a neighbor handy he would tear him limb from limb,
And the thought of social meetings never much appealed to him;
'Till one day a wiser caveman—sort of prophet, priest and scribe,
Pointed out the simple merits of assembling in a tribe,
"Let us work and fight as brothers, with our strength combined," he said,
"For we've got to get together if we want to get ahead."

Let Us Work and Fight as Brothers

So the cavemen took his counsel, which is ample reason why
They were done with being cavemen as the centuries went by,
For the tribe became a kingdom which in turn became a state,
As men learned to know the meaning of the word "Coöperate,"
They coöperated badly—they don't do it well today—
But at least it proved much better than the caveman's clumsy way,
They were on the road to progress, and their leaders wisely said,
"You have got to get together if you want to get ahead!"

Miner and Operator Must Pull Together

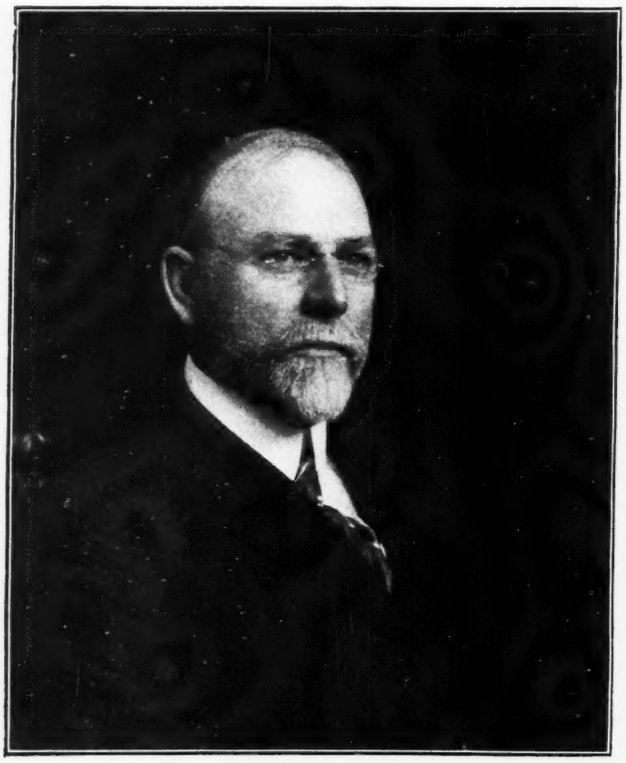
Man is slow to learn his lesson, but we're learning, bit by bit,
That the way to grow and flourish is to use our strength and wit,
Not to *battle* with each other, but to *help* each other on,
That the paths may seem the smoother which we have to trudge upon;
Though at times there is reversion to the days of fang and claw,
We are slowly—aye, but surely—coming to the higher law,
When we'll cease to brawl and bicker and we'll work as one, instead,
For we've got to get together if we want to get ahead.

Adman, Editor and Printer, here's a word or two for you,
Farmer, Middleman, Consumer, Miner, Operator, too;
Those who work with brain or muscle, those who buy and those who sell,
If you hope to thrive and prosper in the world wherein you dwell,
You must learn coöperation, you must cease to work alone,
(Why, the *caveman* stopped that nonsense, just the minute he was "shown.")
Join your forces, be united; for the word is truly said,
"You have got to get together if you want to get ahead!"

James H. McGraw

For more than a quarter of a century, James H. McGraw, who has become the President of the McGraw-Hill Publishing Co., Inc., has been a prominent figure in the field of technical journalism.

In the late 80's three young men, who had come to New York City from country towns only a short time previous, were associated in publishing three small journals, called *Power,* the *Street Railway Journal* and the *Journal of Railway Appliances.* The three men were Emerson P. Harris, H. M. Swetland and James H. McGraw. Harris was the pioneer in establishing the



JAMES H. McGRAW

journals, and he brought the other two young men from their homes in western New York first as employees, but later they became partners. In a short time Mr. Harris sold his interest to the other two men and a separation occurred. Mr. Swetland took the journal *Power,* built it up to a commanding position and sold it in 1902 to the Hill Publishing Co. Mr. McGraw retained the other two journals. His choice was fortunate, for the street-railway business was being revolutionized by the introduction of electricity, and the *Street Railway Journal* was a necessity. In 1896 Mr. McGraw bought a journal called *Electrical Industries,* which he renamed the *American Electrician;* three years later he purchased the *Electrical World* and the *Electrical Engineer,* and consolidated the three papers as the *Electrical World.* In 1902 he purchased the *Engineering Record* and about the same time began the publication of a journal devoted to electrochemistry, which since 1915 has been issued under the title *Metallurgical and Chemical Engineering* as a semimonthly. A year ago a journal called *Electrical Merchandising,* was established. Recently two journals in Chicago devoted to contractors' interests were purchased and are now issued by him as *The Contractor.*

Mr. McGraw has always taken an active interest in the industries represented by his journals. He has been especially prominent in the electrical field and is an Associate of the American Institute of Electrical Engineers. He belongs to the Engineers Club, the Railroad Club, the Republican Club and the Aldine Club, in New York City.

E. J. Mehren

The choice of E. J. Mehren, Editor of the *Engineering Record,* for the position of Vice President and General Manager of the newly organized McGraw-Hill Publishing Co., Inc., is a noteworthy promotion of a civil engineer, comparatively young in years, to an executive position of great responsibility.

Mr. Mehren graduated from the civil-engineering course of the University of Illinois in 1906. His first engineering work was on the locating survey of the Chicago, Milwaukee & St. Paul's extension to Puget Sound; but after a few months he came to New York and began work as an associate editor of the *Engineering Record.* After four years he was offered and accepted the position of manager of the Emerson Co., of New York, efficiency engineers. After little more than a year in this new posi-

E. J. MEHREN

tion he was invited to return to the *Record* as its managing editor, and he was made editor-in-chief in 1913.

Mr. Mehren's progressive work in his conduct of the *Engineering Record* has made him widely known to the engineering profession. At the close of last year two important executive officers retired from the McGraw Publishing Co. and Mr. Mehren was made vice president of that company. When the recent consolidation of the McGraw company and the Hill company was effected, Mr. Mehren was chosen to weld the two organizations into a harmonious working unit.

Editorials

The French Inquiry for Illinois Coals

There has been a tendency to ridicule the reports that French coal buyers have been investigating the possibility of buying Illinois coal. However, it is known positively that representatives of the French Government have been in Chicago and in the Illinois coal fields for several weeks inquiring into the matter of coal supply for making coke in France. It is not yet known whether the coal is wanted for low-temperature distillation or for improved coke ovens which will be erected in France after the war, or whether it is to be used in the present type of oven. No doubt exists that those making the inquiries represent the French Government, and they are now looking into the question of shipping coals from the Southern States. The idea is to forward this coal to New Orleans by rail, for trans-shipment to France from that point.

The representatives are willing to contract for 5,000,000 tons of coal, to be shipped during the next 5 years from the southern Illinois fields, namely, Franklin, Williamson and Saline Counties. The Franklin County operators are understood to have refused to consider the proposition, but the Williamson and Saline County operators tentatively stated that they would be willing to accept one-half the tonnage provided Franklin County took the other half, and with the proviso, of course, that satisfactory terms and prices be arranged. Franklin County has been noncommittal so far on the proposed division of tonnage, and it is not believed that they want to consider it.

It is also known that other Middle Western companies have been approached by Italian coal firms, and others have been asked by several European concerns to quote prices and deliveries on Oklahoma coals for shipment to Europe via Galveston; something may even be done along this latter line this summer.

Mining Battalions

The crisis in our international affairs has reached too acute a stage to be longer evaded. The issue has grown steadily tenser until our participation in the World War has become accepted as inevitable. To what degree this participation will extend is still a matter of conjecture, but it is now an accepted fact that a heavy draft of troops will be made. It is unnecessary to state that the coal industry will furnish its full quota—and probably more.

In this connection a plan is under consideration to provide for the organization of distinct mining battalions to be attached to the various army corps. The miners and sappers have proved of unexpected importance in the European war operations. The foreign technical press has commented repeatedly upon this, while our observers with the European armies have time and again emphasized the importance of mining organizations. The scheme has been placed before General Black, Chief of Engineers, and we have been assured of his heartiest support and coöperation.

In brief, the plan provides for the organization of different units varying from squads of eight men up to companies of 150, or battalions of 500, in all of the mining sections of the country. As an example one of the big companies with 10,000 employees might very easily organize a battalion of say 500 men; from this organization it could also undoubtedly spare a quota of superintendents or engineers to act as commissioned officers, and an adequate personnel of foremen and firebosses to fill the non-commissioned offices. Smaller companies, having say 1000 to 2000 employees, might organize a single company of 100 to 150 men, and so on down to the smallest military unit, a squad of eight men. These smaller units would be assigned to others from the same district and mobilized into units of a battalion or more at selected points. Competent military instructors would then take charge of the training of these units at those points.

The general scheme offers attractive possibilities to those participating. Men are obviously at their best among their own kind, and their own associates. The initial friction of establishing new relations is immediately overcome, and the efficiency of all is materially increased by an inherent understanding of each other. In addition how much more readily would the miner enlist in a unit of which his foreman or fireboss was to be the sergeant, and so on all through the line.

Those interested in this movement should communicate with us immediately. When sufficient numbers have been obtained, General Black will be advised and immediate steps taken to accomplish their enlistment and organization.

New Anthracite Spring Prices

On Monday, Mar. 26, the Philadelphia & Reading Coal and Iron Co. announced that the usual summer discount of 50c. per ton would be made on shipments for the month of April. This makes the prices for shipment during that month as follows: Egg, $3.65; stove, $3.60; nut, $4; pea, $2.30. Following the custom of a number of years past the discount will decrease 10c. each month until the winter prices of $4.15 for egg; $4.10 for stove; $4.50 for nut and $2.80 for pea are reached.

While the reduction on the first three sizes has been forecasted here for the past several weeks, the reduction on pea came as a distinct surprise, considering the present shortage of that size, which even at this time is bringing premiums of from 20c. to 50c. per ton. This action of the largest producing company would seem to bear out our contention of some time ago wherein it was suggested that the shipping companies would probably decide to take their best profits this year on the steam sizes. It is not known as yet whether the other large shipping companies will follow the lead of the Reading, but it is likely they will do so on all grades except pea coal.

The fact that pea coal will be sold at $2.30 during April presents an odd situation, as it is known without a

doubt that many of the larger companies have made very heavy contracts on buckwheat coal at $3 a ton to date from Apr. 1, and there are also well-defined rumors that they have negotiated pea contracts with steam users at a price of $3.50 at the mines. While the retail dealers in a way welcome the reduction, a good many express doubts as to whether they will be able to secure anything near an adequate supply of this size all summer. The chief difficulty of the retail man during April will be that he will receive a flood of orders from his customers anxious to obtain the very lowest price, and they will insist on receiving this price whether the coal is delivered in April or three or four months hence.

With the contract price for bituminous coal ranging from $3 to $3.50 and a smaller tonnage than ever under contract, it is likely that a larger quantity of pea coal will be used for manufacturing purposes. Some of the retail men also intimate that inasmuch as most companies, especially the individual shippers, have buckwheat contracts at $3 and better, it will actually pay them to mix the pea coal with that size and market it as buckwheat, not to mention the still better opportunity of increasing the percentage of pea size in chestnut, of which many complaints were received during the past winter. Unless there is a change of some kind in the prices as issued the first of this week, it would seem that pea coal will gradually slip out of the domestic market by the time winter arrives.

The Alphabet of Business Economy

When an article is badly needed, the price of it goes up and, as a result, there is a big profit in producing it. Consequently large numbers of people, employers and employed, start to extract or manufacture it, and the quantity produced increases till the public is regularly supplied with what it needs. The price then becomes normal. The adjustment, when it is not interfered with, is positively uncanny, so neatly does it work.

Moreover there is another balance. When large profits are made in a business, they fall to those who are best able to extend it. When coal prices are high, coal men get wealthy; and, naturally, they put their money into more coal mines. If it were arranged that when coal became scarce, shoemen become wealthy, not only would the incentive for investment be lacking to the coal men, but the capital also; and the wrong business would be stimulated.

We are painfully aware that some one is smiling at the queer notion that when coal became scarce shoemen might become wealthy, but strange as it may seem the illustration is not much overdrawn: for transportation has become scarce and coal men are making money out of that fact. Bituminous coal is not scarce and is not likely to become scarce, yet men are idle only awaiting for an opportunity to mine it.

When industry is conducted with somewhat free competition, incentive and opportunity at once regulate conditions. The trouble with presidents, commissions, governors, legislators and such other artificial inventions of mankind, is that they are so slow to operate. They fail to modify conditions to suit needs. They should keep their fingers out of the clock unless they can regulate it at least as well as the pendulum. After all, the cleverest of us cannot tell out the minutes with the regularity of the hair spring or the human pulse, and most of the manipulators of commerce cannot keep the industrial mechanism working as well as natural law.

If natural law operated while every one is clamoring for transportation, the prices of transportation would go up more than the prices of coal. Every coal man would be trying to get his coal to market and would pay for the transportation all the traffic would bear. Railroad men would get rich and eventually be able to meet the problem of transportation. But now there is only one hope. We cannot well expect that the railroads will meet our needs. They have no capital; they can secure none. All we can hope to do is to reduce our needs to the railroads' ability to fill them.

We have put bounds on our expansion; we have put a bridle in our mouths and the Interstate Commerce Commission has mounted on our backs. Until we arrange a profit for the railroads, we shall keep capital from flowing in to do their work.

A lot has been said about watered railroad stock and a lack in the railroad conscience. The man who holds coal land worth from $50 to $1200 an acre, which he or someone before him, not to go too far back, bought for $5 and $10 an acre, has he no water in his holdings? When the town lot of the working man has no unearned increment: when the farmer will sell his impoverished land for the price of the virgin territory; when lumber stumpage falls to a few cents a thousand; when patents are sold for the cost of the departmental papers; when no one pays for the good will of an established business—then we can hold the railroads to account for issuing bonds beyond construction cost.

As matters are now constituted, we are none of us entitled, if we own anything at all, to say anything derogatory about the affairs of the railroads. It was the farmer who first watered his "stock" before he sold it. He has watered his prices consistently whenever he could successfully do it, and so have all of us. Why look at the railroad man so disdainfully?

The alphabet of business economy, as has been stated, tells us that what is not produced in sufficient quantity commands a premium. However, there is no scarcity of bituminous coal and yet it is at a high price. The mines can easily supply all that is demanded of them and can do it without difficulty. The only thing lacking is transportation, and because the cost of transportation is tethered, it cannot profit by the favorable conditions.

Consequently the coal man gets the advantage of the dearth of transported coal; and though no one wants him to start regular mines and "wagon" mines, he is doing it to get in on the game. The stimulus goes to the wrong agent. Money is flowing into an over-developed business: it is leaving an under-developed business. In time the coal operator will find the market overstocked, as it was before the war, but what does he care; he is getting his profit now.

But the public is not getting the bituminous coal it needs and is paying excessive prices for what it does get: concurrently, the railroads are getting less and less able to meet the demand on them. We are failing to meet the situation simply because we are opposing forces as elementary as gravity. However, there is no use in being discouraged; we shall muddle through. We always have. There is a saving power in a democracy—it can always change its mind and be unashamed.

Discussion by Readers

Capitol Mine Explosion

Letter No. 1—The facts narrated by a Springfield shotfirer in his article on the explosion at the Capitol mine in the Springfield district, Jan. 20, 1915, *Coal Age*, Feb. 24, p. 349, are quite incredible. If they are correct, one is forced to the conclusion that the mines in that district are being operated in violation of the Illinois Coal-Mining Laws.

For one, I am loath to accept many shotfirers' statements in regard to the length and character of the holes they are expected to fire. It seems to be, too frequently, the shotfirer's idea to spend as little time in the mine as possible. How often have we seen a shotfirer out within two hours after he began to shoot, already washed and on his way home, after having fired between 300 and 400 shots. And what does this suggest to one who knows mining conditions?

From my experience and observation, the average shotfirer does not pretend to examine the holes he is to fire, as the law requires. I have known shotfirers, on going into the mine, to proceed no farther than the inside parting. Here they wait for the miners to come out and get from them the number of shots to be fired in their places. Others go to the men's places and get the number of shots, without approaching the working face to examine and see if the shots are safe to fire. It is well known that there are miners who will drill and charge holes that they would not fire themselves.

While I have never been in the mines of the Springfield district, I can say that any shotfirer who will fire a "5-ft. buster," with an 8-ft. hole on each side, in a narrow place 8 to 12 ft. wide, had better look for some other occupation, as sooner or later he will get what he deserves. Such foolhardiness marks a shotfirer as being a candidate for suicide. Neither can I imagine a miner drilling holes 7 to 8 ft. and more, in an 8-ft. place with a square face of coal, unless there is a slip or break that would give the shot a chance to work.

In regard to the suggestion that shotfirers do not dare to refuse to fire the shots prepared by the miners, for fear of being called a "crank," or regarded as "no good," I want to say that the Illinois mining law gives shotfirers every protection. They are paid by the companies and not by the men.

The Illinois law requires shotfirers to inspect and fire all shots prepared in a practical and workmanlike manner. The law also permits the shotfirer to refuse to fire any shots that, in his judgment, are not properly prepared, and forbids any person to compel the firing of such shots by threats or otherwise.

I can say with certainty that the United Mine Workers in Illinois would uphold any shotfirer in his right to refuse to fire the shot of a miner when it was not properly prepared according to his judgment, provided the shotfirer is a practical, experienced man, which is one of the requirements of this class of employees.

Looking up the Illinois reports for the years 1914, 1915 and 1916, I find that three men were killed while acting as shotfirers, in two separate accidents in the sixth district. One of these accidents occurred in Sangamon County, in the Springfield district, and caused the death of two shotfirers.

W. L. MORGAN.

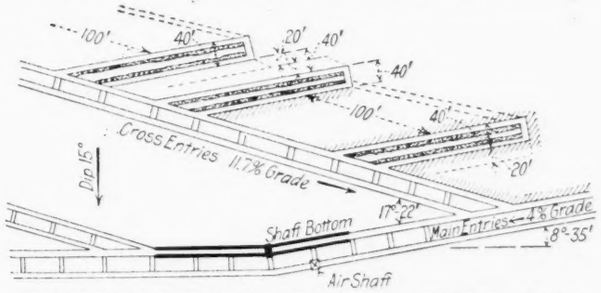
East St. Louis, Ill.

Working 3-Ft. Pitching Coal

Letter No. 9—Replying to the questions asked in the Foreword, *Coal Age*, Feb. 10, relating to the article of Samuel Dean, on page 260 of the same issue, in regard to the method of working a 3-ft. seam of coal pitching from 10 to 20 deg., and overlaid with a 12-in. drawslate that falls easily, permit me to submit the following:

The most economical method of working this seam, in my opinion, would be such a modification of the room-and-pillar method as to provide panel faces that can be worked back on the longwall retreating plan. I have drawn a sketch to illustrate my meaning.

As shown in the accompanying figure, the main entries are driven on a 4 per cent. rise from the shaft bottom, so



PROPOSED METHOD OF WORKING INCLINED SEAM

as to favor the movement of the loaded cars and provide good drainage toward the shaft. The room entries should then be turned to the rise of the main entries, using a back-switch and driving the entries at such an angle as will permit a locomotive to handle a few cars at a time on the grade.

The rooms are back-switched from the cross-entries and driven 40 ft. wide, in a direction parallel to the main entry, which gives a 4 per cent. grade in favor of the loaded cars, in the rooms. As shown in the figure, double-neck rooms are driven in pairs, with 100-ft. pillars between the rooms and 40-ft. pillars between each pair of rooms. The rooms are driven a distance of 300 ft. and track is laid close to the rib on each side of the room. A wall should be built on the gob side of each track, so as to provide good ventilation at the face of the room, the air current passing up one side to the face of the room and returning on the other side to the entry.

When the rooms have reached the limit, the work of drawing back the wide pillars in the rooms and the 40-ft. pillars between each pair of rooms is commenced by cutting across these pillars at the head of the rooms, as indicated by the dotted lines in the figure. This provides

practically a longwall face of 140 ft. of coal, consisting of the 100-ft. pillar and a slab 20 ft. wide drawn back on each rib.

Cars are handled along the working face by means of a ½-in. wire rope passing over a snatch block at the head of the pitch in each pair of rooms. By this means the gathering motor is able to pull the cars up the pitch at the working face to the track along the ribs, where they are made into trips and hauled out of the mine. The empty cars being set in on the upper rib track are then lowered along the face by means of the same rope to which they are attached, a brake being used on the snatch block to check their movement down the grade. With a suitable brake, the operation is prefectly safe.

I would use steel ties and 16-lb. rails in all rooms. These are easily laid and quickly taken up when not longer required. The cars should have a capacity of 1500 lb., which would require a car 7 ft. long, 5 ft. wide across the top and 16 in. inside depth. This car mounted on 12-in. wheels would require headroom not exceeding 28 in. A 24-in. wheelbase makes the car easy to handle in a low seam of coal and has given good satisfaction, as it permits of easy loading.

For cutting the coal, I prefer a longwall mining machine. In order to avoid the danger of ignition of gas, I would provide ample ventilation at the working face. Though I have never known gas to be ignited by a spark from electric machines, I believe that it is possible for this to happen. While one cannot wholly avoid this risk incident to coal mining, every precaution should be taken to avoid such an occurrence.

In respect to haulage on the other side of the shaft, the main entry should be driven with a grade of ¾ of 1 per cent., in favor of the loaded cars. But, instead of back-switching the cross-entries, they should be turned with a forward switch off the main entries, as indicated in the figure. The rooms, however, are back-switched from the cross-entries here, the same as on the other side of the shaft. The cross-entries and the rooms have practically the same direction and grade on both sides of the shaft, but this is not true of the main entries.

Provided there was workable coal lying to the dip of the shaft, this could be reached by driving triple entries from the shaft bottom on the full dip of the seam and using engine-plane haulage to pull the coal from the different levels to the shaft bottom. The arrangement of rooms and entries will be practically the same on the dip as on the rise side of the shaft.

For gathering motors I prefer to use electric storage-battery locomotives. Not having had any practical experience with face conveyors, I can only speak from what I have heard and read. However, I know of two instances where the use of face conveyors proved a failure.

Morgantown, W. Va. W. D. Roberts.

Cleaning Up a Roof Fall

Letter No. 14—Replying to the inquiry of "Miner," *Coal Age*, Jan. 20, p. 165, who I notice writes from my own town and asks if the assistant foreman did his whole duty when he sent men to clean up a fall and did not instruct them how to make themselves safe, allow me to say that the man was asleep on his job and might better be drawing coke than attempting to take charge of men in a mine.

It is always my principle to regard little things, and the big things will then take care of themselves. The omission of a little duty may result in a great accident.

When a fall occurs in a mine, the rule is to send competent men to clear it up. They should be instructed, first, to approach the fall very carefully, sounding the roof some distance back from the edge of the fall and setting crossbars or center posts at the edge of the fall. After doing this, they should be directed to take down all loose slate and timber both sides of the fall back 6 or 10 ft. When this is done, the work of cleaning up the fall can be started.

The timbering of the edges of a fall is necessary on two accounts; first, as a means of safety and, second, to prevent the air current from cutting the roof and causing a fresh fall that would probably take place without warning.

I feel sorry for the assistant mine foreman who would send men to do work of this kind and not caution them to examine the place carefully and make it safe before starting to clean up the fall. I would advise such an assistant foreman to look for work outside of the mine, as work underground is too dangerous to put in his charge. In the present instance, I may say that this assistant foreman did not perform his duty to the men.

Oliphant Furnace, Penn. John H. Wiley.

Letter No. 15—In answer to the inquiry of "Miner," *Coal Age*, Jan. 20, p. 165, allow me to say that I am not inclined to censure the assistant foreman he mentions as not performing his whole duty when he failed to give instructions to the men whom he sent to clear up a fall of roof.

Timbermen should be miners with broad, practical experience, and should be competent to handle a fall of roof safely without instructions from their foreman, who cannot be expected to visit every roof fall in a large mine and give special instructions in regard to the work.

For two years, I served as timberman in a mine where the roof was troublesome in certain sections. I never waited for instructions from the foreman to clean up a roof fall that occurred where I was working. I knew that it would have to be cleaned up and timbered, and proceeded to do the work at the first opportunity. I was frequently informed of a fall that had occurred and was reported to the foreman, but he left me to use my own judgment in performing the work.

In the case cited by "Miner," the timbermen should have been competent and capable of using their own judgment in performing such work. The pulling down of loose slate about the edges of falls, as suggested in some of the letters, instead of making a place more safe, may render it more dangerous than before. An experienced timberman may be deceived in regard to the safety of the roof around a fall when, to all appearances, it is sound and safe but, in truth, is heavy and ready to fall. The usual test by sounding is not infallible and does not always reveal the danger.

In conclusion, let me say that if the timberman in this case was a good miner and experienced in his line, the assistant foreman should not be censured because he gave such a man no explicit instructions. On the other hand, if the timberman was an inexperienced miner and knew practically nothing about the safe timbering of roof falls, he should not have been sent to do the work, even

with instructions as to how to proceed. In that case, the assistant foreman is to blame for sending him on such an errand.

My experience has been that many miners depend too largely on their foreman to point out to them dangerous conditions, and do not exercise their own judgment in regard to the safety of their working places.

JOHN ROSE,
Former District Mine Inspector.

Dayton, Tenn.

[This closes the discussion of "Cleaning Up a Roof Fall."—Editor.]

Bruceton Test of Clearfield Dust

Letter No. 4—Referring to the letter of John Verner, published in *Coal Age*, Dec. 23, p. 1057, I do not understand him as claiming that the Bruceton test has not proved that the dust taken from the Clearfield mines can be made to explode under favorable conditions. Neither do I believe that he thinks, for one moment, that any dust will fail to ignite when there is sufficient heat applied and the dust is dry.

I understand Mr. Verner as claiming that the dust in Clearfield County has not been shown to be explosive under the conditions prevailing in those mines and when subjected to the ordinary methods of mining. His argument is that dust, in order to be explosive, must contain certain volatile constituents and be found in a finely divided state and dry. In this respect I think most of us can agree, otherwise we would have to admit that the dust in anthracite mines is likewise dangerous.

While it is true that, at the time the Federal Bureau of Mines was first advocated, there were many mining men who believed that coal dust was explosive under certain favorable conditions relating to the volatile constituents and the fineness and dryness of the dust, there were still others who were in doubt in regard to such a possibility. It was to convince such skeptical men of the explosibility of dust that the Bureau of Mines was established.

The work was placed in charge of competent mining men, whose duty it became to investigate this and other questions relating to the safe operation of coal mines. The engineers of the bureau have performed their duty well and broadcasted the results of their experiments, together with suggestions in regard to avoiding dangerous conditions and reducing the loss of life and property.

The latest bulletin, "Coal-Mine Fatalities in the United States," compiled by Albert H. Fay, and issued Jan. 31, 1917, gives in Table 2, pp. 8 and 9, the total number of fatalities in mines, from all causes, for the two years 1915 and 1916, as 4494 lives. Of this number 207 lives were lost, in the same period of time, by the explosion of gas and dust combined. This is but 4.6 per cent. of the total number of fatalities in the two years mentioned.

The bulletin does not give a single life lost by the explosion of dust alone, and yet there are far greater quantities of fine dust elsewhere, in a much drier state than that found in Clearfield County. The reason for this is the shallow cover overlying the Clearfield County coal field and the penetration of large quantities of surface water into the mines beneath.

In one mine where it was stated that the bureau had secured a sample of dust for the Bruceton test, the condition with respect to water finding its way through the strata into the workings was such that I am satisfied that, were a keg of powder to be ignited in the mine, the flame would not be propagated a greater distance than that due to the combustion of the powder. In that mine the inflow of water from the strata is so continuous and extensive that it is almost impossible to keep the roadways clear. It is quite evident that these conditions common to Clearfield County mines are essentially different from the conditions under which the Bruceton test was conducted.

In defense of the value of the Bruceton test, Sim C. Reynolds argues, *Coal Age*, Mar. 3, p. 405, that to ask the bureau engineers to explain how the conditions in the Bruceton test differed from those existing in the Clearfield mines is asking them to explain "what is already known to every mine official, mine owner and miner: namely, that practically all bituminous coal dust is explosive under certain conditions and quite as certainly nonexplosive under other conditions." He then follows with the statement that the test was made "solely to convince a few obtuse mine owners operating in the Clearfield district that the dust taken from their mines is explosive." The second statement appears to contradict the first, inasmuch as it admits that there are some mining men who need to be convinced of what Mr. Reynolds just stated everybody knew.

THE TRUE CONCERN OF THE BUREAU OF MINES

Again, Mr. Reynolds says, "The Bureau of Mines need not concern itself with the question of ascertaining under what conditions the dust of the Clearfield mines can be considered as inexplosive." It is well known, however, that the bureau does concern itself in these matters by advocating the watering of mines and the stonedusting of airways, and in doing so they are but fulfilling their duty, by advising precautions that should be taken to reduce the possibility of the explosion of dust.

I quite agree with his statement that Clearfield operators believe that "because the mines of that district have been practically free from coal-dust explosions, the presence of dust in those mines was not a menace to safety." I cannot blame them for holding this opinion, especially as anything else would mean an increased rating of the mines. It would be a mistake, however, to regard these mines as dangerous, on account of dust, as mines where conditions render the dust a real menace.

Few coal operators will agree with Mr. Reynolds in the statement that "Eventually, the Bruceton test might result in a reduction of present rates." It is to be hoped that this will be the case and that the miners in the Clearfield district will receive some benefit from such a reduction of rates.

MINER.

Philipsburg, Penn.

Duties of Mine Examiners

Letter No. 2—Referring to the Illinois mine law that requires the posting of a suitable danger signal as notice to all men to keep out of a place where the mine examiner has found the roof to be dangerous, I do not understand this to refer to a loose rock that he has marked to be taken down. I agree with the writer of Letter No. 1, *Coal Age*, Jan 20, p. 162, who expresses the opinion that it is not the intent of the Illinois law to exclude a miner from his place because a loose rock must be taken down.

My thought is that the law expects men to use common sense in this respect. On the other hand, should the roof be dangerous or a recent fall have occurred in the place, the men should not be permitted to enter for work. The mine examiner (fireboss) must be the judge as to these conditions. He is the man who is responsible if he permits a miner to proceed with his work and an accident should occur.

It often happens that a fireboss when making his examination of a mine and discovering any danger, is unable to find a suitable sign to mark the place and warn persons to keep out. He would be saved much trouble and delay if the company provided him with danger signs that he could carry with him on his rounds.

Suggests Permanent Sign at Mouth of Each Room

Let me suggest that a good method to adopt would be to have a danger board or sign at the mouth of every room that could be plainly marked or turned to indicate some danger in the place, whenever the examination showed that it was unsafe for men to enter.

Provided a capable man is working in a place found to contain a dangerous piece of top that is marked to be timbered or taken down, it seems to me that the fireboss should instruct the man to do the work at once, instead of holding him out of his place until company men can be sent to do the work for him. This would have the effect of making a man largely responsible for his own safety. There should be a general rule in every mine forbidding men to enter any place with which they are not familiar, or where their duty does not call them.

Nanticoke, Penn. W. A. Barrett.

Assistant Mine Inspector

Letter No. 1—A short time ago I read an account of a bill before the Pennsylvania State Legislature creating the office of assistant mine inspector in the anthracite region, *Coal Age*, Feb. 17, p. 333.

Candidates for this office were to be examined by boards appointed by the courts of Luzerne, Lackawanna and Schuylkill Counties. Each examining board was to consist of one mine foreman and two miners chosen from the district, and successful candidates were to receive a rating in the examination of 75 per cent. The salary of the twenty-five assistant inspectors provided by this bill was to be $2000 per annum.

Assistants Would Perform Same Duties as Inspectors

In this connection let me suggest that the duties of an assistant mine inspector would naturally be of the same nature and require the same capability as those of the inspector himself. If this is true, let me ask why should not the rating of candidates for that office and the salary paid the incumbent, be as high as the mine inspector's rating and salary? Again, if a candidate for the office of mine inspector is required to attain a mark of 90 per cent. in the examination, why should not an assistant inspector be required to receive a rating equally as high.

In my opinion the candidate for assistant inspectorship should be required to pass the same examination and receive the same rating as the candidate for the higher office, and the compensation for these offices should be the same, inasmuch as their duties and responsibilities are practically equal.

There can be no doubt that inspectors should make more frequent visits to the mine than is possible with the present force; but, instead of providing assistant inspectors, the situation would seem to require increasing the number of mine inspectors. Better results would be obtained and quicker action afforded where each inspector is able to act independently in his own district, and is responsible only to the chief of the Department of Mines.

To expect the same service and capability in a lower priced official, who is made subordinate to another in his district, is not reasonable. An inspector's visit to a mine should be first-handed. He can then act with more decision and his suggestions will be received with greater respect by the operator, than where he must refer to a superior officer in the district.

In closing, I want to say that the most effective supervision of the mines can only be obtained by reducing the size of each inspection district, so that the inspector can give proper attention to the mines in his charge, each inspector acting on his individual authority.

West Leisenring, Penn. R. W. Lightburn.

Mine-Safety Inspector

Letter No. 1—Referring to the many mine accidents reported in *Coal Age*, and the suggestion of employing assistant mine inspectors, I wish to offer a few suggestions. Accidents are happening daily in the mines notwithstanding all the precautions that are being taken to avoid them. It would seem that the only way to reduce the number of these accidents is through a more constant supervision of the underground workings than is possible by the present system.

Good results have been obtained in this direction in many large mines, by the employment, by the company, of a safety mine inspector, whose sole duty is to look after everything relating to the safety of the men and the mine. Such an official devotes his entire time to the supervision of the mine workings and the men employed therein. He is, in fact, what his title implies, a "mine-safety inspector." Such a man, if he is competent and industrious, will earn more than his salary for the company that employs him.

Advantage of Employing Safety Inspector

Where a safety inspector is employed, and makes his rounds every day, the mine will be kept constantly in the same condition. It will not happen that when the time approaches for the mine inspector to make his visit extraordinary efforts will be made to put the mine in good condition. I have known instances where, previous to such an event, whitewash would be flying and men working day and night guarding electric wires, cleaning up the roadways and travelingways, repairing doors and stoppings, and doing other like work to improve the condition and ventilation of the mine and obtain a high rating in the inspector's report. Everything must be in apple-pie order.

Look, for a moment, at the present organization of a mine. There is the mine superintendent, who spends, perhaps, a few hours a week underground. He goes there more to see what the chances are for a good output of coal, and to ascertain what is necessary to be done to increase the tonnage of the mine. It is seldom that his visits are in the interest of safety. The cost sheet is

his main consideration, and he has enough to attend to looking after these duties.

The mine foreman is directly responsible for the daily output, together with the safety of the mine and the men in his charge. He knows he must produce the coal and, for that reason, he expects his firebosses to look after the safety of the mine, although they are underground but a few hours while the men are at work. The fact that mine accidents are still of daily occurrence proves the need of more definite steps being taken for their prevention in every branch of the work.

Mine explosions are not the only class of accident that occur; neither do they produce the greatest number of fatalities. The fatality rate is most largely increased by the minor accidents that are of daily occurrence, due to falls of roof and coal, movement of cars, etc. To prevent these accidents will require constant supervision by a competent man. I would suggest that the safety inspector make a regular report to the state mine inspector of the district, and coöperate with him in every measure for safety. VIGILANT.

Moundsville, W. Va.

Mine-Accident Record

Letter No. 16—If the mine-accident rate is to be lowered, all mine workers must learn to obey instructions promptly and live up to the safety measures adopted in the mine.

The coal-mining reports of Illinois for the year ending June 30, 1916, show that 165 men were killed and 1305 so injured as to lose 30 or more working days. Of these fatalities 48.5 per cent. were the result of falling coal or rock, while 23 per cent. were due to mine cars. Probably 50 per cent. of these accidents could have been avoided with a little more care and by obeying instructions.

The district in which I am working is one of the largest producing counties in the state. The demand for coal has been good during the fall and winter, with the result that many accidents have happened that I know could have been prevented had the victims used more caution.

Machine Runner, Refusing To Heed Warning and Protect Himself, Is Killed by Fall of Coal

In one instance a machine runner was warned by the assistant foreman that there were indications of a slip in the roof a short distance in advance of the face he was cutting. He was told to set a post close to the face after each run. When informed that he would not be paid for setting the post, he replied that he would stand no timbers without pay.

On his fourth run the coal fell, the machine having cut under the slip. The man was caught by the fall and so badly mangled that he died before he could be taken out from beneath the coal. The assistant reached him soon enough to hear him say, "Jack, if I had listened to you, I would not have been here now." He disobeyed orders and paid the price.

The Illinois Mining Law requires that a light be carried on the front of a locomotive, and that a gong, red light or other marker be placed on the rear of a trip of cars when it is being hauled in or out of the mine. In one mine the company had furnished a short pipe filled with oil and provided with a hook by which it could be hung on the rear car. It was some trouble for the motorman to carry this torch back and hang it on the last car of each trip, and the men frequently took chances and put the torch in the motor instead of hanging it in its place on the end of the trip.

Bonus to Drivers Causes Accident

One day the mine had a good start and the foreman promised the drivers to give them each an hour extra time if they would beat their record. Everyone hurried to make the best time possible. The torch was not hung on the rear of the trip and the motorman could not tell, on reaching the inside parting, whether he had lost any cars or not. They took the chance.

It so happened, however, that two cars became uncoupled from a trip and ran back into a swag on the road, where they remained until struck by the motor coming out with the next loaded trip. The machine was derailed by the collision and the motorman, caught between his motor and the rib, was taken out dead. The inquest showed two minutes saved by not hanging the marker on the end of the trip, one life lost and much added expense and delay.

Another accident was caused by a capable mine examiner taking a chance on a defective lamp. He was asked by the mine foreman to hurry in and clear a place of gas that had been reported that morning. After starting in, he discovered that the bottom gasket had not been put in the lamp he was carrying. But, to avoid delay, and hoping to please the foreman, he decided to take a chance with the lamp.

The result was that the gas was ignited and the man now lies in the hospital with a face badly burned and the sight of one eye gone forever. His health is so impaired that it is probable he will never be able to work again. He took a chance and lost.

Others "Take Chances" and Lose

In a large mine in this field the assistant foreman found a bad piece of top in a room where the roof was working. Having ordered the loaders to quit and leave the room at once, he proceeded to get timbermen to secure the place and make it safe. While he was gone the men went back to finish loading their car and were caught under the fall. One of them was so badly injured that he lived but a few hours, while the other escaped with a leg and an arm broken.

In closing I will mention briefly two other accidents that have happened recently. A shotfirer, after lighting a shot in one room, went directly into the next room to light another. He had just lit the second when the first shot blew through the pillar, burning him badly.

In another instance a miner coming out on the haulage road was passed by a motor hauling a trip of cars. As the trip went by him he stepped back onto the road without looking to see if any other cars were following. It happened that three cars had broken loose from the trip and the man was knocked down, run over and killed instantly.

The wonder of it all is that the frequency of these avoidable accidents do not teach men to be more careful in their work, and to exercise greater caution while in the mine, for the sake of their own protection.

Herrin, Ill. OSTEL BULLOCK.

Inquiries of General Interest

Ignition of Gas by Electric Lamps

Kindly give me what information you can in regard to the possibility or probability of gas being ignited by the breaking of the bulb of an electric lamp, in a gassy mine. I have been informed that it has been satisfactorily proved that a portable electric lamp will not ignite gas if the bulb is accidentally broken in the mine and want to ask if this is true. MINE FOREMAN.

Elmora, Penn.

The Federal Bureau of Mines has made a very elaborate series of tests to determine under what conditions the accidental breaking of the bulb of an incandescent lamp will result in the ignition of an explosive mixture of gas and air, with which the lamp may be surrounded in the mine. The results of these tests have been published in Bulletin 52 of the Bureau of Mines.

A large number of tests were made in a manner to resemble as closely as possible the different ways in which the bulbs of incandescent lamps might be broken by an accidental blow. In one series of tests the bulbs were completely smashed while the lamp was burning in a mixture of gas and air at its most explosive point. The breaking, in this manner, of the bulb of a standard lamp, used for general illumination, resulted almost invariably in the breaking of the filament, and the gas was ignited almost simultaneously with the blow that destroyed the bulb.

In another series of tests only the tip of the bulb was broken off, thereby admitting air to the interior of the lamp. As stated on page 8 of the bulletin mentioned, the way in which the gas-charged air enters the bulb of an incandescent lamp when it is broken has an important bearing on the ignition of the explosive mixture by the lamp filament.

In the series of experiments in which the tip of the bulb was broken there were three conditions manifest: (1) The inrush of air was so violent as to break the carbon filament, in which case no ignition of the gas took place. (2) The filament was quickly cooled by the rush of outside air into the bulb, but was not broken. In this case ignition followed. Those lamps with the larger filaments quickly recovered their temperature and ignited the gas at once, but those having smaller filaments required a longer time, from one to five minutes, before ignition took place; but the gas was always ignited. (3) In case the filaments were not cooled by the inrush of air and gas, ignition generally took place before the bulb was completely filled with the explosive mixture. The result was that the explosion that followed did not break the bulb, as in the other instances.

The tests to which we have referred were all made in a gas-tight box or receptacle so arranged that it could be filled with an explosive mixture as desired. The tests were, thus, more severe than if made in a moving current, since ignition always takes place more readily in still air. The breaking of the bulb was accomplished by means of a sliding rod that could be struck with a hammer from the outside. The breaking of the tip of a bulb was accomplished by a swinging arm actuated by a spring. This arm swept over the top of the bulb when released, breaking off the tip without destroying the bulb.

Fan Calculation

A question has come to me that I am at a loss to know how to answer. Can you help me by giving the solution in *Coal Age?* The question is as follows:

A fan 20 ft. in diameter is running at a speed of 100 r.p.m. and producing 100,000 cu.ft. of air in an airway. If the total length of the airway is 3000 ft., what is its sectional area? MORGAN WATKINS.

Parsons, Penn.

The only way in which this question can be solved is to estimate, in pounds per square foot, the possible pressure that the fan will create when running at the given speed. Then, knowing this unit pressure on the air, calculate the sectional area of the airway by assuming that the latter is square, using the well-known formula

$$p = \frac{kloq^2}{a^3}$$

For a square airway, the perimeter (o) is equal to four times the square root of the area (a), or $o = 4\sqrt{a}$. Making this substitution in the formula for unit pressure, and solving with respect to the area, we have,

$$a = \sqrt[5]{\left(\frac{4klq^2}{p}\right)^2}$$

It is first necessary to find the tip speed (u) of a 20-ft. fan when making 100 r.p.m. This is found as follows:

$$u = \frac{\pi Dn}{60} = \frac{3.1416 \times 20 \times 100}{60} = 104.72 \text{ ft. per sec.}$$

Murgue has established the fact that the theoretical depression due to the action of a centrifugal fan is equal to the square of the tip speed expressed in feet per second, divided by the force of gravity ($g = 32.16$ ft. per sec.). The depression so found is expressed in feet of air column, which, multiplied by the weight of 1 cu.ft. of air (0.0766 lb., normal condition) gives the unit pressure (p), in pounds per square foot, due to the fan; thus,

$$p = 0.0766\frac{u^2}{g} = 0.0766\frac{104.72^2}{32.16} = 25.53 \text{ lb. per sq.ft.}$$

Finally, substituting this and the given values in the formula for finding the sectional area of a square airway, we have:

$$a = \sqrt[5]{\left(\frac{4 \times 0.00000002 \times 3000 \times 100{,}000^2}{25.53}\right)^2}$$

$$= 97.55 \text{ sq.ft.}$$

This shows the airway to be practically 10 ft. square. The question and the answer given are purely theoretical and only have a suggestive value in practice.

Examination Questions

Wyoming Mine Foremen Examinations Held at Different Places—1917

(*Selected Questions*)

Ques.—What is meant by splitting the air current, and what, if any, are its advantages?

Ans.—An air current is split when it is divided into two or more separate currents, each division of the air then forming what is called a separate "split."

The advantages derived by splitting the air in mines are the following: (1) A larger quantity of air is circulated under a lower pressure or water gage by the same power. (2) The mine is divided into separate districts, the return from each district being conducted at once into the main return airway by which it is carried out of the mine. (3) The ventilation of the mine is under better control, since the quantity of air passing in each district can be proportioned to the requirements therein. (4) High velocities of the air at the working face are avoided. (5) Trouble or explosion occurring in one district does not necessarily affect other districts of the mine, each having its own circulation.

Ques.—Explain the principle of natural ventilation in mines.

Ans.—Natural ventilation is that produced by natural causes, such as air columns formed in shafts and slopes or rise and dip workings, owing to the natural heat of the mine. Natural ventilation may also be due to wind pressure acting on one of the openings of the mine more than on another.

The principle, in the case of air columns, depends on the difference in the temperature of the two columns, which makes a difference in weight and causes the heavier cold column to overbalance the lighter and warmer column of air. As a result, the colder air sinks and the warmer air rises, thus creating downcast and upcast currents in the two shafts or slopes that form the openings of the mine and producing a circulation of air through the mine airways connecting these two openings.

Wind pressure acting on one of the mine openings also produces a ventilating pressure that causes a circulation of air through the mine. The fall of water through a shaft is another means of producing ventilation in a mine, but this may or may not be natural, depending on the conditions.

Ques.—In an airway 7 ft. high and 6 ft. wide, the rubbing surface is 2684 sq.ft. per sq.ft. of section; what is the length of the airway?

Ans.—The sectional area of this airway is $7 \times 6 = 42$ sq.ft. The total rubbing surface is therefore $2684 \times 42 = 112{,}728$ sq.ft. The perimeter of this airway is $2(7+6) = 26$ ft. Finally, the length of the airway is found by dividing the rubbing surface by the perimeter, which gives $112{,}728 \div 26 = 4335$ ft.

Ques.—When about to examine a mine for explosive gas, what is the first duty of a fireboss before entering the mine, and what should he do after going into the mine?

Ans.—The first duty of a fireboss is to prepare and test his lamp. Assuming that the lamp has been thoroughly cleaned, examined and filled, the fireboss should light the lamp and test it by any means available before entering the mine. He should then observe that the ventilating apparatus is working properly.

Having descended the shaft and given sufficient time to recover his eyesight in the darkness, the fireboss should proceed at once to the foot of the intake slope or downcast shaft and observe whether the usual volume of air is passing into the mine. He should then follow the main intake at once to the mouth of the district that he is to examine.

Proceeding with the air, he examines each working place in order, taking care to ascertain that there are no accumulations of gas in any working place or in cavities of the roof or other void places. In this manner he completes the examination of his district and returns to the bottom of the shaft or slope where he makes out his report. If he finds, in his examination, any danger whatsoever, he must bar all entrances to such place, by means of a proper danger signal, and note the danger and its location in his report, which he must sign before leaving the mine and pronouncing it safe for work.

Ques.—If an explosion should occur in your safety lamp, or the lamp should suddenly fill with flame, what would you do to insure your safety?

Ans.—A fireboss when making a test for gas should always be ready for such an occurrence. He must keep cool and make no quick movement, but slowly lower his lamp or withdraw it from the gas. The most critical time in making a test for gas is when withdrawing the lamp from an explosive mixture that has entered and filled the combustion chamber. The entry of fresh air into the lamp may convert this mixture into one that is highly explosive, with the result that the flame of its explosion may be blown through the gauze and ignite the gas outside of the lamp. The lamp, under the conditions named, must be withdrawn with great caution and, if still flaming, should be smothered carefully under the coat, which will help to give the needed protection while withdrawing from the place.

Ques.—In an old mine generating explosive gases, what dangers arise that are not met with in new mines generating such gases, and how would you overcome them when discovered?

Ans.—In an old mine there is always danger of the possible accumulation of firedamp mixtures in abandoned places that are not thoroughly ventilated and do not receive the attention, in this respect, they should. This condition does not exist to the same extent in new mines, where there are comparatively few places that are not thoroughly swept by the air current. In an old mine there is also the danger of heavier roof falls, setting free large quantities of gas. These dangers common to old mines should be overcome by thoroughly ventilating all abandoned and void places where gas can accumulate.

Coal and Coke News

Washington, D. C.

In making their formal application to the Interstate Commerce Commission for a percentage advance in freight rates throughout the country to compensate them for the increases in wages under the Adamson Eight-hour law, the railroads stated that the proposed advance would except the rates on coal, coke and ore. Upon these commodities the roads have already made or are proposing specific advances, which, it is estimated, will bear their just proportion of the compensation sought.

In accordance with the general rate advance scheme the eastern roads have proposed to put in effect, on April 1, new tariffs naming an increase in tidewater rates on bituminous coal from Virginia and West Virginia fields to Hampton Roads, and increased rates on coke to interior Virginia destinations. Other tariffs, proposed to become effective on Apr. 16, or later dates, would increase the tidewater rates on bituminous coal from fields in Pennsylvania, Maryland, Virginia, West Virginia, Ohio and Kentucky to New York, Philadelphia and Baltimore; and on Lake cargo coal; also increase the rates on bituminous coal from Pennsylvania and Ohio fields to Buffalo and Buffalo rate group points.

The proposed increases per ton on coal are 10c. to Hampton Roads; 5c. to Upper Tidewater; from 5c. to 15c. on Lake cargo coal; 15c. to Buffalo rate points; and from 10 to 65c. on coke to Virginia stations.

In presenting their plea to the Interstate Commerce Commission for the advance in the coal and coke rates and for the general percentage advance, a delegation of railroad presidents and their attorneys appeared before the Commission last week. They requested that the Commission shall not at this time suspend any of the advances, but permit them to go into effect and decide later as to their specific reasonableness. It was charged that there exists at this time a national emergency which must be met. This emergency is not only economic but is also at the present time one of national defense against an enemy, because the railroads afford one of the best means of defending the United States against military invasion.

Samuel Rea, president of the Pennsylvania R.R. system, acted as chief spokesman for the railroad executives. Mr. Rea based his plea upon patriotic considerations as well as commercial necessity. "Under the existing international complications and the exceptional industrial activity," he said, "there should be no delay in placing the railroads in a strong financial condition in order that they may place themselves in a strong physical condition to meet the needs of the country."

Reasons cited by Mr. Rea to show the immediate necessity for higher rates on coal and other freight included the enormously advanced cost of materials and fuel, the Supreme Court decision on the Adamson wage act, the scarcity, high price and inefficiency of labor in general, and the constant increases in taxes.

Advances in fuel prices alone, Mr. Rea said, will involve an added cost of at least $37,000,000 per year to 7 carriers of the east. The principal articles used in the operation of the Pennsylvania lines east of Pittsburgh, he continued, have risen in price an average of 78 per cent. in the last two years. In many cases the advances have been far greater. Axles have risen 173 per cent., steel bridge material 148 per cent. Equipment, he said, had risen at least 50 per cent. The Adamson Act decision, Mr. Rea stated, will advance wages of the men affected on the Pennsylvania lines east of Pittsburgh at least $9,000,000 per year on a conservative estimate. In addition, since the first of the year it has been necessary to authorize wage increases to other employees amounting to $4,800,000 per year.

Contract Prices are Decidedly Higher

With the arrival of the time when many firms are making new contracts, some users of considerable quantities of coal are awakening to the fact that they can not renew their agreements at anything like the old figures. Many of them are writing indignant letters to the U. S. Geological Survey asking if there is no way of escaping the advance. One nationally known mercantile establishment, for instance, in a letter to the Federal Trade Commission, asks if there is any real basis for increasing its contract price for coal from $1.50 to $3.50. The letter was referred to the Geological Survey. Such inquiries are being answered in this manner:

"Since October and November, of 1916, the demand for bituminous coal has been greater than the producer (because of labor shortage) and the railroads (because of lack of cars and motive power and generally congested conditions of their transportation systems) have been able to deliver it. The price accordingly has risen to levels not previously recorded for any like period of time in the history of this country. Whether prices will recede depends, of course, upon this balance between supply and demand. Competent observers are of the opinion that the experience of coal consumers in the past six months will lead them to store coal during the summer months in larger quantities than heretofore, but that the scarcity of labor available for mining coal and the inability of the railroads to move the coal to destination at a rate much greater than at present, will prevent material relief.

For this reason, it is expected that the demand for coal next fall will be sufficiently strong to maintain prices somewhere near their present level. Published reports of contracts recently closed for bituminous coal indicate that many large consuming interests will pay from 50 to 100 per cent. more for their fuel during the coming year than in 1916. There is ample evidence in the history of the industry to show that prices will not resume the former low level prevailing in 1914 and 1915."

No Material Increase of Output

The assumption in some quarters that bituminous coal production is certain to increase markedly this year because numerous new mines are being opened has brought forth this statement from George Otis Smith, the director of the U. S. Geological Survey:

"If the assumption of many operators is correct that the labor supply will be the limiting factor in the production of coal this year, rather than transportation facilities, it is apparent that the opening of new mines will not augment the production greatly. This will be true because with the supply of men for mining coal limited practically to those now so engaged, new mines will be able to operate to the extent only that they are able to draw labor from the old mines. The output from the new mines will little more than offset the decreased production of the older mines through loss of men."

PENNSYLVANIA

Anthracite

Scranton—A decision handed down on Mar. 24, by the State Supreme Court, sustains the decision of the court of Lackawanna County in fixing a value of $300 per foot acre on anthracite coal in place in this county. The decision adds $26,450,000 to the assessed valuation of the county and means an increase in taxes for the coal companies of $618,350 in 1916 over the amount paid in 1915. The assessment is for three years, 1916, 1917 and 1918, and means that coal in place during these three years will pay vastly greater taxes than it did during the preceding three years. The assessment was raised from $175 a foot acre to $300 a foot acre.

Mahanoy City—A verdict for the plaintiff in the sum of $1200 was returned recently by the jury in the case of Jeremiah Green and wife, vs. the Lehigh Valley Coal Co. The suit was brought to recover damages for the death of their son, who was killed by falling through a hole in the floor of the jig house at the Buck Mountain colliery, on May 11, 1915.

Wilkes-Barre—All the mine foremen examining boards in nine sub-districts of Luzerne County have been reappointed by the court to serve for the ensuing term. There is but one change, that in sub-district No. 9, where Edward C. Curtis, a mine inspector becomes chairman of the board in place of S. J. Jennings who resigned.

Moosic—Trustees for the heirs of the Martin Crippen estate, have filed a deed conveying the valuable Crippen culm bank to the Howard Anthracite Coal Co. The dump is considered one of the most valuable in the Lackawanna region. By the terms of the deed the coal company agrees to pay the Crippen heirs at the rate of 35c. a ton for every ton of culm washed from the dump, while on the silt or ordinary refuse, the royalty rate is 20c.

Hazleton—The Lehigh Coal & Navigation Co. is equipping its Cranberry mines for electric operation, to replace steam power, at a cost of about $300,000. Three electrically driven pumps have been installed as part of the initial work. The company will also increase the output at the local properties.

The Lehigh Valley Coal Co. is taking precautionary war measures to guard its properties from cranks who may be led by the threatened talk of war to commit depredations. It is admitted that in event of hostilities a continuance of operations in the mines will be one of the most important factors in the situation.

Pottsville—The Philadelphia & Reading Coal and Iron Co. announced, on Mar. 27, that on and after Apr. 2, the price of egg, stove, and nut coal would be reduced 50c. per ton. This is the first intimation from the big companies that they would reduce coal prices this spring.

Bituminous

Brownsville—Transportation of coal and coke by way of the Monongahela River continues to rapidly increase. New boats are making their appearance every day, many of them having been purchased and placed in commission between the mines up river and the large steel mills near Pittsburgh.

Examinations for certificates of mine foremen, assistant mine foremen and firebosses in the 16th bituminous district will be held in Brownsville Apr. 10, 11, 12 and 13. The written examinations will commence every morning at 9 o'clock. Those wishing to be examined for firebosses certificates should present themselves Apr. 13. All applicants are required to give the chairman of the board notice in writing at least six days prior to the date of the examination. The Board of Examiners is composed of W. H. Howarth, chairman, J. J. McIntyre, and J. O. Van Riper.

West Middletown—There is a prospect of the extension of the Burgettstown-Cedar Grove branch of the Pennsylvania R.R. to tap an 8000 acre coal tract in southern Independence Township. Engineers have been at work for several days locating the line which it is anticipated will run south from Cedar Grove to Avella, turning up Cross Creek 1½ miles and crossing the Wabash R.R., through several farms into the Buffalo Creek Valley to a point near the West Virginia state line.

DuBois—Notice has been given in the 4th bituminous district that an examination for certificates for mine foremen, assistant mine foremen and firebosses will be held in DuBois Apr. 10, 11, 12 and 13, commencing at 9 o'clock each day.

Connellsville—Shipments of coke from the Connellsville district recently totalled 360,000 tons per week. These are the largest for any similar period this year, being a gain of 8500 tons over the preceding week. The production totalled 358,079 tons, or an increase of 8855 tons. There was a net increase of 44 in the number of active ovens. The car supply was estimated at about 55% of requirements.

When E. L. Downey of Smithfield recently ran a heading from J. R. Smith's mine into his own lot adjoining he found all the coal gone from under his land. The coal had been taken out many years ago by "Paddy" Bradley who hauled it out with a horse and cart. "Old Dan's" tracks and the marks of the old cart are as plainly visible in the soft bottom as when made nearly half a century ago.

Indiana—Mrs. Jennie Karslala, aged 27, and her 18 months old son, were instantly killed and a 3 year old daughter painfully injured recently at Ernest, 6 miles north of this city, when a case of coalite, placed near the kitchen stove was accidentally exploded. Mr. Karslala had just brought the case of explosive from the store and had returned to get some household articles when the explosion occurred. The house was blown to pieces and both bodies were hurled into the yard as was the injured girl, who was in the front part of the house when the blast came.

Johnstown—The effort of the Pennsylvania R.R. to stop the "wagon loaders" from loading in anything but box cars and to charge an extra freight rate to those without a regular loading tipple failed when the Public Service Commission ruled that the wagon loaders had a right to any kind of a car and without the additional freight rate. The "wagon loaders" in this section are numerous and have organized an association which had attorneys represent them at the hearing in Harrisburg.

Punxsutawney—The Stewart Coal Co., has sold its mine at Timblin, this county, to the New York "World" for a consideration said to be in the neighborhood of $125,000. The "World" owns paper pulp mills and the coal will be shipped to these mills in New York state.

Sagamore—The Buffalo & Susquehanna Coal Co.'s operations at Sagamore were badly crippled recently when the motor barn and 13 electric mine locomotives were destroyed by fire entailing a loss of $40,000. Incendiarism is suspected.

Irwin—The Westmoreland Coal Co. has raised large American flags at the entrances to six of its mining properties.

Canonsburg—The coroner's jury in the inquest into the death of the 14 men who were killed in the Hendersonville No. 1 mine of the Henderson Coal Co., on Mar. 13, brought in a verdict on Mar. 22. No one was held directly responsible for the accident, but the jury recommended that the fireboss, and mine foreman, be censured for neglect.

WEST VIRGINIA

Huntington—The operation of a coal mine at East Lynn in Wayne County has been begun by the Logan Coal Co. The coal will be hauled by teams a distance of a mile or more to the railroad for the present.

Wheeling—The Elm Grove Mining Co. recently organized, has opened a mine at Triadelphia. Preparations are also being made for the employment of several hundred men. Work is being pushed on the building of the surface plant at the mine so that everything will be ready for operation, and the mine working at full capacity in a few weeks.

Charleston—Within six months two large mining operations in addition to those already being worked will be opened on Main Island Creek. These will be near the town of Switzer. A bridge will be constructed across the creek by the Main Island Creek Coal Co. The Island Creek Colliery Co. is also interested in the project, and will transfer to the other company a right of way to its property.

Fairmont—The increased demand for a good grade of coke has stimulated production to the extent that the Consolidation Coal Co. is now producing more of this fuel than ever before. New ovens are also to be started as quickly as they can be put in condition for firing.

After having been closed for 17 years, the old O'Donnel mine will soon be opened. A branch line from the Monongahela Ry. will be put in to the operation, and all the production of the opening will be handled on that road. Approximately 150 men will be employed when the mine is working to full capacity.

Welch—Ground is being broken at Jacobs Fork in McDowell County for a new mine of the New River & Pocahontas Coal Co.

Williamson—A number of carloads of coal from the lands of the United Thatker Coal and Coke Co. have been shipped to Gary, Ind., for testing, preparatory to taking up a large lease for development.

ALABAMA

Birmingham—In order to facilitate the handling of the output of the coal mines served by the Louisville & Nashville R.R. in this district that line has installed telephones at a large number of such operations with direct connections with the office of the chief dispatcher. This arrangement has greatly expedited the movement of coal and coke and enables the railroad to keep in instant touch with car supply.

The election of Waddill Catchings to the presidency of the Sloss-Sheffield Steel and Iron Co. aroused considerable interest in this district, as it is thought to indicate a widening in the scope of activities of the company. The Sloss company has seven blast furnaces, six of which are maintained in active operation, six coal mines, three ore mines and a dolomite quarry, and a large acreage of undeveloped coal and ore lands. The greatest present need of the company is an increased coke production, and it is reported that steps will be taken at once for the rehabilitation of a large number of bee-hive ovens at Coalburg, which have been out of commission for years, pending the construction of a large by-product plant, which has been in contemplation for some time.

KENTUCKY

Martin's Fork—The Republic Coal Co. is making some increases in its output in this field, increasing to about 15 cars daily. The company promises other increases from time to time during the spring and summer.

Whitesburg—Eastern operators are in the southern section of Letcher County looking over coal properties with a view to making developments. It is likely that at least two new developments will be started in the vicinity of Blackey on the Louisville & Nashville R.R. So far the whole southern section of the county is undeveloped.

Fleming—Continued rains have much hampered mining work in a large number of the mines throughout the eastern Kentucky field, according to reports reaching here. In some instances mines have been practically flooded. There has been an unparalleled amount of rain throughout this section within the past two months.

McRoberts—Twelve trains daily, averaging 30 cars each, are now going out over the North Fork extension of the Louisville & Nashville R.R. from the Boone's Fork field—more than ever before in the history of the development of this section. All mines are operating full time, though heavy rains have impeded progress in a measure, in some of the plants. Business was never better in the coal fields surrounding McRoberts.

Louisville—As spring draws nearer, there are signs that this year will be the biggest from the point of coal operations, new companies and the opening of new fields, Kentucky has ever known. Throughout the mountain coal sections preparations are being made for operations on an unprecedented scale. The car problem is much better in all sections, in fact it is believed car shortage soon will cease to worry the mine operators to any great extent. Leases are being secured in many districts. This is especially true of the sections around Whitesburg.

Henderson—Damage to the extent of several hundred dollars was caused at the Robards coal mine, when unidentified persons entered the engine room at midnight, started the machinery and dashed one cage to the bottom of the shaft, hurling the other through the tipple. The mine employs 75 men and will be idle until repairs are completed.

Lexington—The College of Mines and Metallurgy of the University of Kentucky has announced an eight-weeks' course for practical miners, to begin Apr. 2. Instruction is free and the course covers work for examinations for state mine foremen's certificates.

OHIO

Columbus—One of the largest deals in coal properties in the eastern Ohio field has been completed by the organization of the Great Lakes Coal Mining Co., incorporated with a capital of $1,250,000, which has purchased the property of the Somers-Roby Coal Co. The announcement was made some time ago that this property, which consists of 5000 acres, with two working mines had been purchased by the C. Reiss Coal Co., of Sheboygan, Wis. Later it developed that the Reiss and New Pittsburgh Coal Co., interests have combined to operate the property. The company has elected Peter Reiss, of Sheboygan, president; G. C. Weitzell, vice-president and general manager; William A. Reiss, treasurer; W. I. Kennedy of Cleveland, assistant secretary, and W. D. Morse of Columbus, assistant treasurer. The mines have a daily capacity of 5000 tons. It is planned to ship the product during eight months of the year to the Lakes and the remainder of the time the output will be handled through the Columbus office. Steps are being taken to increase the acreage in that territory by the purchase of adjacent property.

Martins Ferry—Miners of the local subdistrict at their convention voted to join with 50,000 other miners in the state to circulate petitions for 100,000 signatures of persons in favor of the old-age pension amendment. In the absence of the Rev. Herbert Bigelow, in charge of the Ohio Old Age Pension League, G. W. Savage, miners' state secretary, spoke.

INDIANA

Petersburg—Local coal operators are leasing 800 acres of coal land, a short distance south of this city, and will soon open a railroad mine.

ILLINOIS

Johnson City—The Johnson City Coal Co. is buying more coal land, and the probabilities are that this firm will sink another shaft somewhere to the northward of this city.

Carlinville—Operators in the central Illinois field expect to keep their mines working through the summer without the usual lay-off. They have received information that the railroads are planning to store great quantities of coal, beginning in May, so as to have their winter supply on hand before the fall rush sets in, so that all their cars will be available for handling commercial shipments. It is believed that this will go far toward solving the car shortage problem.

West Frankfort—The two large mines here, sunk some years ago by J. K. Deering and for the past few years in the hands of receivers and known as the Producers Coal Co.'s mines, the output of one of which has been handled by the Peabody Coal Co. and the other by J. K. Deering, of Chicago, have been sold with all their holdings to the By-Products Coke Corporation for an amount between $2,000,000 and $2,250,000. In addition to the mines there is considerable other property and over 8000 acres of coal.

Springfield—A recent canvass of the coal miners in the central Illinois district shows that about 50 per cent. are in favor of the abolition of the saloon. Duncan McDonald, retiring secretary-treasurer of the Illinois United Mine Workers, is taking in active part in the dry campaign in Springfield.

Representatives of the Branch government who have been inspecting different Illinois fields with a view to making large contracts, have decided that the Sangamon County output will not be considered because it has such a large percentage of sulphur that there would be too much danger of spontaneous combustion on shipboard.

Urbana—Coal operators in the St. Louis field are watching with interest tests by the Seramics department of the University of Illinois on 106 samples collected by the State Geological Survey from typical coal mines for the purpose of determining whether the production of clay or shale, in connection with the production of coal, is feasible and could be made profitable. The samples were from pits that are producing coal but have not been producing clay. Fifty-seven samples are reported to warrant further investigation wherever local commercial conditions are favorable. The tests give ground for the belief that it may be found cheaper to produce clay in connection with coal mining than to mine it separately or dig it from surface pits.

Staunton—The Mt. Olive & Staunton Coal Co. has obtained in the Circuit Court at Carlinville an injunction against Albert Batchler, Virgil Batchler, Alton Batchler, J. G. Duis, James Gayther, H. H. Hoper, Fred Struck, William Struck, Louis Miller, W. P. Wall, Martin Lee and John Camp, restraining them from drilling for oil and gas through lands on which the company holds coal rights in the vicinity of Staunton and Mt. Olive. The petition states that the defendants have recently been drilling through the strata owned by the coal company and that in one instance after drilling to a depth of 600 ft. a shot of nitro-glycerin was fired, which cracked and made fissures in the surrounding earth, after which the casing was withdrawn and the hole plugged, all of which was injurious to the coal company's property. It is also alleged that the defendants contemplate drilling other wells. In similar cases in this section heretofore the courts have permitted the drilling for coal and gas under such safeguards as the particular situation demanded.

KANSAS

Ft. Scott—Coal mining operations on a large scale are to begin at once in this vicinity. A company has bought 446 acres of land 8 miles north of this city, under which at a depth of from some 6 to 18 ft. is a bed of coal averaging 2 ft. in thickness. A stripping operation will be started. Negotiations are under way for the purchase of 350 more acres of land adjoining this tract. Cottages will be erected for the employees.

OKLAHOMA

Okmulgee—The Kincaid Coal and Mining Co., operating in the Henryetta coal fields, has paid to Mrs. Mamie Leblo, widow, $2300 in settlement of her claim against the company because of the death of her husband, a coal miner, who was killed on Jan. 13, 1917, when he came in contact with an electric cable carrying current to the mining machine on which he worked.

COLORADO

Denver—It is reported that the Consumers' United Coal Mines Co. is preparing to enter the business of refining coal-tar products. This firm is now producing coal for fuel purposes at what is said to be a net profit of $1 per ton. It plans to increase its profits by coal-tar refining, which is said to yield as high as $6 per ton.

Personals

Robert Reavely, appointed by Gov. Lowdon of Illinois as county mine inspector of Sangamon County, has resigned. His term would not have expired until next December.

Matthew Blair, superintendent of the Thomas mines of the Davis Coal and Coke Co., has been promoted to general superintendent of the entire Thomas district with headquarters at Thomas, W. Va.

Arthur B. Stewart, of Brookville, Penn., has been appointed by A. W. Calloway, president of the Davis Coal and Coke Co., as general counsel for the Davis company with headquarters at Baltimore, Md.

J. N. Douglas, secretary and treasurer of the American Safety Lamp and Supply Co., of Scranton, Penn., has been commissioned by President Wilson a captain in the Reserve Officers' Corps of the United States Army.

E. G. Lawrence, sales manager of the Lumaghi Coal Co. and the Williamson County Coal Co., is confined to St. Anthony's Hospital, in St. Louis. The physicians have given up hopes of his recovery from cancer of the stomach.

James Purcell, president of District No. 2 of the United Mine Workers of America has resigned his position. The resignation took effect Mar. 22 but the reason for the action has not been stated. His term of office had but a few days to run.

A. W. Calloway was reëlected president of the Davis Coal and Coke Co., when the directors met recently and made the coal company a separate corporation from the Western Maryland R.R. The capital stock was increased from $250,000 to $4,250,000.

W. S. Ingraham, famous as a clock manufacturer of Bristol, Conn., was in Sparta, Ill., recently on a trip of inspection of his properties, the Illinois Fuel Co., where extensive improvements will soon be under way looking toward a greater production.

P. J. Rogers of Birmingham, Ala., has been reappointed president of the State Board of Convict Inspectors. J. M. Keyser of Albertville, and Dr. Russell A. Smith of Brewton, were appointed associate members of the Board by Gov. Henderson recently.

H. F. McDonald, secretary of the Berry-Bergs Coal Co., of St. Louis, has resigned, effective Apr. 1, to take charge of the general offices of the Baum Coal Co., which will be removed from Omaha to St. Louis. A branch office will be maintained in Omaha and one in Chicago.

Harry A. Lawrence, of the fuel department of the Rock Island R.R. in Chicago, has resigned to become fuel purchasing agent for the Union Electric Light and Power Co., of St. Louis, and its allied industries that are under the control of the North American Syndicate of Milwaukee.

Mrs. Libby E. Roth, daughter of John Maule, a well-known retired coal operator of Belleville, Ill., has taken up her father's work and is now the head of the Maule Coal Co., the name of which will be changed to the L. E. Roth Coal Co. Mrs. Roth is a widow. She will have entire charge of the business and will maintain an office in East St. Louis.

Obituary

Ferdinand W. Roebling, secretary and treasurer of John A. Roebling's Sons Co., died on Mar. 16 last.

William Atkins, Sr., a wealthy coal operator, with offices in the North American Building, died at the Hotel Strand, Atlantic City, on Mar. 24, after an illness of three months. Mr. Atkins was connected with the Kingswood Coal Co. and the Vincent Coal Co. He was graduated from Lehigh University and later entered the coal business. He was the son of Charles Atkins, a wealthy steel manufacturer of Pottsville, Penn. Mr. Atkins made his home at the Union League, of which he had been a member since 1892. He was 61 years old and is survived by one son, William Atkins, Jr.

Catalogs Received

Fairbanks Power Hammers. United Hammer Co., 141 Milk St., Boston, Mass. Catalog. Pp. 16; 3½x6 in.; illustrated.

"A Chain of Evidence." Morse Chain Co., Ithaca, N. Y. Publication No. 15 covering small power drives. Pp. 20; 6x9 in.; illustrated.

"Arcwall" Coal Cutters for the "Over Cutting" System of Mining. The Jeffrey Manufacturing Co., Columbus, Ohio. Bulletin No. 191. Pp. 12; 8x10 in.; illustrated.

The Care and Operation of Jeffrey 35 B-Short-wall Mining Machine. The Jeffrey Manufacturing Co., Columbus, Ohio. Bulletin No. 192. Pp. 16; 6x9 in.; illustrated.

Electrical Supply Year-Book. Western Electric Co., Inc., 195 Broadway, New York. This is the Third Edition of this book and follows the plan of uniform list prices with one basic discount which enables one to determine quickly the approximate cost of any article. Pp. 1312; 7x10 in.; illustrated.

Publications Received

Annual Report of the Dept. of Public Works in the Province of Alberta for 1915. Unillustrated; 307 pp., 7x10 in.

Stone in 1915. By G. F. Loughlin. Dept. of the Interior, U. S. Geological Survey. Illustrated; 82 pp., 6x9 in.

Peat in 1915. By Graham S. Turp. Dept. of the Interior, U. S. Geological Survey. Unillustrated; 4 pp., 6x9 in.

Report on Coöperation in American Export Trade. Federal Trade Commission, Part II. Unillustrated; 597 pp., 6x9 in.

Annual Report of the Federal Trade Commission for the Fiscal Year ending June 30, 1916. Unillustrated; 63 pp., 6x9 in.

Annual Report of the Secretary of Mines of Victoria, Australia for the Year 1915. Unillustrated; 124 pp., 8x13 in.

U. S. Government Specifications for Portland Cement. Circular of the Bureau of Standards, No. 33. Illustrated; 43 pp., 7x10 in.

Copper in 1915. General report by B. S. Butler. Dept. of the Interior, U. S. Geological Survey. Unillustrated; 67 pp., 6x9 in.

Report on Coöperation in American Export Trade. Federal Trade Commission, Part I, Summary and Reports. Illustrated; 387 pp., 6x9 in.

Annual Report of the Director of the U. S. Mint for the Fiscal Year ended June 30, 1916. Illustrated bound volume of 286 pp., 6x9 in.

Metals and Ores in 1914 and 1915. By J. P. Dunlop. Dept. of the Interior, U. S. Geological Survey. Unillustrated; 10 pp., 6x9 in.

Operating Details of Gas Producers. By R. H. Fernald. Dept. of the Interior, Bureau of Mines, Bulletin 109. Unillustrated; 74 pp., 6x9 in.

Annual Report of the Iowa Geological Survey for 1914. George S. Kay, State Geologist. Illustrated bound volume of 607 pp., 7½x10½ in.

California Mineral Production for 1915 with Mining Law and County Maps. California State Mining Bureau, Bulletin No. 71. Illustrated; 193 pp., 6x9 in.

Biennial Report of the State Inspector of Mines of Nevada for 1915 and 1916. A. J. Stinson, State Inspector of Mines. Unillustrated; 77 pp., 6x9 in.

Annual Report of West Virginia Dept. of Mines for 1915. By Earl A. Henry, chief of the Department of Mines. Illustrated bound volume of 335 pp.

Investigations of Gravity and Isostasy. By William Bowie. Dept. of Commerce, U. S. Coast and Geodetic Survey. Illustrated; 196 pp., 9x11½ in.

Nineteenth Annual Report of the Bureau of Labor and Industrial Statistics of the State of Virginia for 1916. Unillustrated bound volume of 146 pp., 6x9 in.

Report on the Production of Spelter in Canada in 1916. By Alfred W. G. Wilson. Canada Dept. of Mines, Mines Branch. Unillustrated; 60 pp., 6½x10 in.

Gold, Silver, Copper, Lead and Zinc in Nevada in 1915. Mines Report by V. C. Heikes. Dept. of the Interior, U. S. Geological Survey. Unillustrated; 42 pp., 6x9 in.

West Virginia Geological Survey County Reports for 1916, covering Jefferson, Berkeley and Morgan counties. Illustrated bound volume of 644 pp., with accompanying maps.

Geography of the Upper Illinois Valley and History of Developments. By Carl A. Sauer. State of Illinois, State Geological Survey, Bulletin No. 27. Illustrated bound volume of 208 pp., 6½x10 in.

Quarry Accidents in the U. S. during the Calendar Year 1915, compiled by Albert F. Fay. Dept. of the Interior, Bureau of Mines, Technical Paper 165. Unillustrated 77 pp., 6x9 in.

Clay Working Industries and Building Operations in the Larger Cities in 1915. By Jefferson Middleton. Dept. of the Interior, U. S. Geological Survey. Unillustrated; 68 pp., 6x9 in.

Prospecting and Mining of Copper Ore at Santa Rita, N. M. By Donald F. McDonald and Charles Enzain. Dept. of the Interior, Bureau of Mines, Bulletin 107. Illustrated; 122 pp., 6x9 in.

Molybdenum, Its Ores and Their Concentration, with a Discussion of Markets, Prices and Uses. By Fred'k. H. Horton. Dept. of the Interior, Bureau of Mines, Bulletin 111, Mineral Technology 115. Illustrated; 132 pp., 6x9 in.

The Analytical Distillation of Petroleum. By W. F. Rittman and E. W. Dean. Dept. of the Interior, Bureau of Mines, Bulletin 125, Petroleum Technology 34. Illustrated; 79 pp., 6x9 in.

The Principles and Practice of Sampling Metallic Metallurgical Material with Special Reference to the Sampling of Copper Bullion. By Edward Keller. Dept. of the Interior, Bureau of Mines, Bulletin 122. Illustrated; 102 pp., 6x9 in.

Analyses of Coals Purchased by the Government during the Fiscal Years 1908 to 1915. By George S. Pope. Dept. of the Interior, Bureau of Mines, Bulletin 119. Unillustrated; 118 pp., 6x9 in.

Surface Subsidence in Illinois Resulting from Mining. By Lewis E. Young. State of Illinois, State Geological Survey, Coöperative coal mining series, Bulletin 17. Illustrated; 112 pp., 6x9 in.

Summary Report of the Mine's Branch of the Dept. of Mines of Canada for the Calendar Year ending Dec. 31, 1915. Illustrated; 213 pp., 6½x9½ in.

Surface Water Supply of the U. S., 1913. Part XI. Pacific Slope Stations in California. Dept. of the Interior, U. S. Geological Survey, Water Supply Paper 361. Illustrated; 514 pp., 6x9 in.

Seventeenth Annual Report of the County Inspector of Mines for Madison County, Ill., for the year ending June 30, 1916, compiled by Robert W. Grieve, inspector. Unillustrated; 7 pp., 6x9 in.

Methods of Testing Natural Gas for Gasoline Contents. By G. A. Burrell and G. W. Jones. Dept. of the Interior, Bureau of Mines, Technical Paper 87, Petroleum Technology 21. Illustrated; 26 pp., 6x9 in.

Subsidence Resulting from Mining. By L. E. Young and H. H. Stoek. Illinois Coal Mining Investigations. Bulletin 91, Engineering Experiment Station, University of Illinois. Illustrated; 205 pp., 6x9 in.

The Tractive Resistance on Curves of a 28-Ton Electric Car. By Edward T. Schmidt and Harold H. Dunn. Bulletin No. 92, Engineering Experiment Station, University of Illinois. Illustrated; 54 pp., 6x9 in.

Physical and Chemical Properties of Gasoline Sold Throughout the U. S. during the Calendar Year, 1915. By W. S. Rittman, W. A. Jacobs, and E. W. Dean. Dept. of the Interior, Bureau of Mines, Technical Paper 163, Petroleum Technology 38. Illustrated; 45 pp., 6x9 in.

Industrial News

Louisville, Ky.—The Iroquois Coal Mining Co. has increased its capital from $25,000 to $40,000.

Cincinnati, Ohio—The Ohio & Kentucky Fuel Co. has increased its capital from $25,000 to $50,000.

Somerset, Penn.—The S. M. Hamilton Coal Co. has increased its capital from $60,000 to $100,000, for extensions.

Pittsburgh, Penn.—The Hanlin Coal Co. has been incorporated with a capital of $25,000. H. M. Hollway is principal incorporator.

Pineville, Ky.—The Geisler Coal Co., with a capital of $1500, has been incorporated by J. H. Bolton, John Geisler and J. S. Redding.

Middlesboro, Ky.—The Bellman Coal Co. has been incorporated with a capital of $3000 by C. S. McManus, J. L. Manring and W. E. Cabel.

Gatliff, Ky.—The Archer Blue Gem Coal Co. has been incorporated with a capital stock of $2500 by W. M. and B. M. Archer and S. C. Davenport.

Pineville, Ky.—The Black Raven Coal Co. headquarters at Lexington, Ky., has given notice of dissolution through Joshua Speyer, secretary.

Harriman, Tenn.—The Carbon Coal Co., with a capital stock of $15,000, has been incorporated by G. E. Chandler, R. K. Hill, L. O. Scott and others.

Point Marion, Penn.—The Greene County Coal and Coke Co. has been incorporated with a capital of $75,000. George Cartier is head of the company.

Hazleton, Penn.—The Lehigh Valley Coal Co. is planning for the construction of a new breaker in the Council Ridge section, formerly known as Buck Mountain.

Middlesboro, Ky.—The Queensbury Coal Mining Co., with capital stock of $9000, has been incorporated by Charles E. Herd, C. W. Willis and W. V. Tennett.

Cleveland, Ohio—The R. A. Woods Coal Co., Cleveland, was incorporated on Mar. 9 for $50,000 by Robert A. Woods, Harry Kirschner, A. Z. Jost, B. Hollinger and M. E. Stechow.

Cordova, Ala.—The Disney Coal Co. has been formed at Cordova, Walker County, incorporators being A. R. Disney, B. A. Schroeder and C. E. Butt. The capital stock is $2000.

Greensburg, Penn.—W. L. Bowman, E. S. Keay and H. C. Patton have incorporated at Albany, N. Y., the Phoenix Coal Co., Inc., with capital of $15,000, to operate in coal, coke and natural gas properties.

Johnstown, Penn.—About 20 new dwelling houses are to be erected by John Lochrie at Central City during the coming summer. The town is growing rapidly, and these houses are badly needed.

Prestonsburg, Ky.—The Drift Coal Co. was organized here recently by Frank B. Socol, Emil Von Emert, Waldemar Zuendorff and others with $30,000 capital. It will develop properties on Beaver Creek, it is said.

Wadsworth, Ohio—The Oco Coal Co. has been incorporated with a capital of $100,000 to mine and sell coal. The incorporators are N. S. Everhard, E. J. Young, Don A. Young, Wm. Everhard and George G. Geisinger.

Cleveland, Ohio—The Fairview Coal Co. has been incorporated with a capital of $30,000 to mine and sell coal. The incorporators are John T. Scott, David L. Johnson, M. C. Byrnes, B. E. Robertson and M. C. Myers.

Commercial, Ala.—The Commercial Coal Co. has been incorporated at Commercial, Walker County, with a capital stock of $2000. J. I. Bellinger, Joe Johnson and W. R. Morgan are the incorporators of the new company.

Middlesboro, Ky.—The Orby Coal Co., with a capitalization of $4000, has been incorporated by U. Pardini, J. D. Yarbrough, J. Stanley and H. C. Chappell. The mine the company will develop is located near Orby Station.

Columbus, Ohio—"The Black Diamond," the Ohio mine rescue car, is now at Ohio State University, and when not in actual service at the mines is used for demonstration purposes in connection with the mining school.

Columbus, Ohio—The Great Lakes Coal Mining Co. has been incorporated with a capital of $1,250,000 to mine and sell coal. The incorporators are C. E. Blanchard, R. J. Odell, H. J. Bradbury, F. F. Smith and L. T. Lyle.

New **Lexington, Ohio**—The Star Manufacturing Co. has been incorporated with a capital of $150,000 to manufacture mine supplies. The incorporators are J. C. Shirer, H. F. Acker, J. S. Woodcock, Paul Gordon and R. W. Murray.

Praise, Ky.—The Elkhorn City Coal Co., recently organized, will develop the Potter coal land tract on the Clinchfield road where it proposes a daily output of 500 tons to begin with. The work is expected to start within the next 30 days.

Glouster, Ohio—C. C. Sharp, of Nelsonville, Ohio, has announced that he is organizing a new coal company which will open three new mines near Glouster, to operate the No. 7 bed. The company will employ about 800 men, it is understood.

Somerset, Penn.—The Victor Coal Co., of this place, has awarded a contract for the erection of ten houses at its mine near Holsopple at once and will award another contract for about 25 more as soon as the weather will permit their construction.

Johnstown, Penn.—Hess Bros., local contractors, have been awarded two contracts of miners dwellings. Ten houses are to be built for the Meco Coal Co. in Indiana County, and ten more are to be built for the Pretoria Coal Co. at Holsopple.

Pikeville, Ky.—The Beaver-Elkhorn Coal Co., organized at Ashland, Ky., by James G. Serey, S. E. Harmon, J. S. Hopkins and others, will, it is stated, make a coal development on the Chesapeake & Ohio R.R. in Pike County, the work to be started by Apr 15.

Cleveland, Ohio—Lake coal shippers are having some trouble chartering vessels to carry their coal to the head of the Lakes at what they consider reasonable rates. One boat owner declared that he would send his boats upbound light rather than take coal at less than $1.

Henderson, Ky.—The equity in the Keystone Mining Co. has been sold to Liverwrite & Cunningham, of Philadelphia, for $15,000. The purchasers had previously bought the rest of the interest in the property. It is expected that the operations will be extended.

Harlan, Ky.—The Richland Coal Co., of Kentucky, has been organized at Harlan by E. R. Clayton, J. R. Cameron, Ed Pursiful and others with $6000 capital for the purpose of developing coal properties along Martin's Fork. This territory is being rapidly developed.

Philadelphia, Penn.—The Emmons Coal Mining Co., Land Title Building, is preparing articles of incorporation to be filed at Harrisburg, Mar. 26, and upon granting of charter plans for early operations. Louis C., James A., and J. Grey Emmons are the incorporators.

South Fork, Penn.—The South Fork Bituminous Coal Co., of which J. C. Stineman of this place is president and general manager, will begin the construction of a new plant to develop a tract of 750 acres of C prime coal. It will be reached by a slope about 125 ft. deep.

Philadelphia, Penn.—The West Virginia & Pennsylvania Coal Co., Inc., has been incorporated under New York laws with a capital of $100,000, to engage in coal mining operations. G. L. Leshen, 1 Broadway, New York City, is representative for the company.

Philadelphia, Penn.—The Security Coal Co. has been organized to engage as a holding company for certain coal properties in the state. Application for a charter has been made at Harrisburg. Edgar M. Bechtel, David G. Wilson and Harry S. Claghorn are the incorporators.

La Viers, Ky. (P. O. Seco, Ky.)—The South East Coal Co. will begin this spring the construction of 100 additional miners' houses at a point near La Viers. Other improvements will follow. The company proposes a number of extensions and improvements during the present year.

Pikeville, Ky.—The Winston Creek Coal Co. has just been organized here by A. C. Long, D. R. Coleman, Crit May, J. H. Adkins and others for Pike County development of coal lands. The initial work will start this spring. It is understood that this firm will develop a 1000-ton output daily.

Buffalo, N. Y.—The Penn Central Coal and Coke Co., which is now operating a mine of Frank Williams & Co., of Buffalo, under lease from the receiver, has also leased the farm of J. I. Hulings in Brady Township, Clarion County, Penn., and will put in a tipple and open a mine in about 60 days.

Weston, W. Va.—Approximately $3,000,000 will be expended in general improvements by the new owners of the Coal and Coke R.R. One of the first of those proposed is the completion of a 3-mile branch to connect Adrian and Buckhannon. This construction will shorten the eastbound freight haul by 27 miles.

Buffalo, N. Y.—The Lake Erie car ferries have begun their season. They load coal at Conneaut and Ashtabula, Ohio, for several Canadian ports on the north shore of the Lake. In winter the ice is too heavy for them to operate. The route enables shippers in the Canadian trade to avoid the congestion at Buffalo.

Arcola, Tex.—Arcola Production Co. has been organized with headquarters at Houston, Tex., for the purpose of producing oil, mining coal, sulphur and other minerals in Texas. The company has been incorporated with a capital of $20,000. Incorporators are: J. H. Carroll, B. W. Armstrong and D. B. Vinson.

Washington, Penn.—Four hundred and ten acres in Independence Township near Avella were purchased recently by L. M. Irwin, cashier of the Lincoln National Bank of Avella. The price paid was $200 per acre. It is understood that Mr. Irwin represented the Waverly Coal Co., whose main office is in Pittsburgh.

St. Louis, Mo.—Options are being taken on coal lands in Stookey and Millstadt townships, St. Clair County, Ill., by a company organized by W. C. Wolf, John Taylor and John D. Vogt, of Belleville. The plan is to sink a shaft at a point from which the product can be readily shipped into St. Louis over the new free bridge.

Smalley, Ky.—The Buck's Branch Coal Co. has been organized here by Samuel M. Lambert, E. B. Crocket, John M. McCall and others with a capital of $12,000 to make a coal development on Beaver Creek along the new branch of the Baltimore & Ohio, now nearing completion. The initial construction work will be started at once.

Columbus, Ohio—The Maynard Coal Co., of Columbus, Ohio, is offering for sale $92,500 of 6 per cent. cumulative serial sinking fund preferred stock. The money derived from the sale of the stock is to be used for extensions and development purposes. The authorized capital of the company is $350,000, of which half is preferred.

Pittsburgh, Penn.—The Wayne Coal Co. is breaking ground for its second operation, which it is expected will be started within 30 days. This operation will be known as No. 2, and will be worked on the continuous system, preparing coal through a tipple with automatic sizers and crushers. This plant will have a capacity of 1500 tons per day.

Harlan, Ky.—Interests of the town of Harlan will build an eight-mile line of railroad from Kilday to Seagraves Creek to open an important undeveloped coal field, the construction to be started at once. Dr. A. Gatliff, Williamsburg, Ky., Judge William Lewis, C. D. Ball, John A. Creech and others, of Harlan, are organizing for a big coal development along the new road.

Washington, Penn.—A preliminary injunction was recently granted the Pennsylvania R.R. Co. against the Lilley Coal and Coke Co., of West Brownsville. This prevents the latter concern from continuing to remove coal from under the tracks and railroad shops of the Pennsylvania company at that place. A mine cave of considerable extent recently occurred along this company's right-of-way.

Williamson, W. Va.—The United Thacker Coal Co. has brought an ejectment suit in the Federal Court against the Pigeon Valley Coal Co., and others following an injunction in the Federal Court against the Valley company from mining from the property claimed by the United Thacker Co. in Mingo County. The injunction and ejectment suit will be heard at the next term of Federal Court in Charleston.

Huntington, W. Va.—A transaction was recently completed whereby W. E. Deegans, L. N. Frantz, John Faulkner, William Brown and I. J. Rhodes have secured the Del Carbo Coal Co. This company owned several thousand acres in the Logan coal field, including a tract under lease to the Virginia-Buffalo, the Deegans-Eagle and other large operating companies. The deal is said to have involved about $100,000.

Buffalo, N. Y.—The announcement that the Pennsylvania R.R. will charge demurrage on all coal shipped on Lake Ontario through the port of Sodus Point has frightened the bituminous shippers here who have been in that trade. They say that it is impossible to bring lake tonnage there to meet the trains and as the delays are on account of the irregular running of the trains the road should stand the loss.

Washington, D. C.—The Secretary of War, on Mar. 23, ordered Allegheny County and the Pennsylvania R.R. to elevate the bridges over the Allegheny River at Pittsburgh, thus ending a fight that has been waged for 14 years to open the river for coal transportation. All the bridges are the property of the county with the exception of the Fort Wayne bridge, which is the property of the Pennsylvania Railroad Co.

Jackson, Ky.—The Jackson Block Coal Co., with a capitalization of $12,000, has been incorporated by R. D. Baker, Winchester, Ky.; W. M. Pursifull, Hazard, Ky.; Lewis Hays, Jr., and G. W. Centers, Jackson, Ky. The company takes over the holdings of the Davis Coal Co., of Jackson, and will increase the output to 500 to 600 tons daily. Additional acreage has been acquired from the Kentucky Union Land Co.

Huntington, W. Va.—Announcement was recently made that the Huntington Lumber and Supply Co. had landed two large orders for its ready-cut houses. These embrace a $75,000 order from the New River Co. of McDonald, W. Va., and another order of the same size from the Rum Creek and Byproduct Coal Co. Unfilled orders of this firm now on hand amount to over a quarter of a million dollars.

Ogden, Utah—It is reported that the Government has placed a guard at each of the mines of the Wyoming Coal Co. in the Rock Springs district, and at all bridges and tunnels of importance on the railroad in the intermountain country. It is also stated that the Government intends to supervise the operation of coal mines if necessary as a part of the program of mobilization of the country's resources for national defense.

Columbus, Ohio—The Falk Coal Co. is the name of a new producing concern recently formed with offices in Columbus. It is a partnership composed of F. E. Falk, formerly purchasing agent for the Sunday Creek Coal Co., and Nicholas Monsarrat, a mining engineer who has just closed the receivership of the Continental Coal Co. The concern has leased mine No. 19 from the Sunday Creek Coal Co., located on the Zanesville & Western R.R.

Johnstown, Penn.—The Marianna Coal Co. has placed an order with the Cambria Steel Co. here for 1000 steel hopper cars.

The Valley Smokeless Coal Co. of this city has awarded a contract to Markebile Brothers for the construction of a large machine shop at Krings Station on the Baltimore & Ohio R.R. It is the intention to do all the repair work and build all the mine cars for the several mines of the company at this point.

McAlester, Okla.—The Pittsburg Development Co., with headquarters at Oklahoma City, announces plans for developing its holdings near McAlester, consisting of coal lands. The company will erect a modern brick-making plant with a capacity of 100,000 bricks per day. Coal will be mined from its land, and the clay that is mined with the coal will be burned into brick while the lump coal will be sold. The slack will be manufactured into gas and used as fuel in burning the brick.

Washington—Frank Taplin of the Cleveland & Western Coal Co., of Cleveland, Ohio, recently purchased the properties and holdings of the Meadowlands Co. This firm operates two mines in Washington County. The purchase price is said to have been $600,000 or more. The Meadowlands Co. has been in the hands of receivers for nearly two years. Both mines purchased employ large forces, and are modernly equipped. The Meadowlands Co. owns several thousand acres of valuable coal land and recently purchased an additional tract near Avella.

Cincinnati, Ohio—Jewett, Bigelow & Brooks have filed suit against the Republic Coal Co., of Kentucky, for $60,000 damages, on account of alleged breach of contract by the Kentucky company for the handling by the Cincinnati concern of its entire output of egg coal from its Harlan County mines. According to the plaintiffs, only a part of the output was delivered up to October, and after that time, it is declared, the Republic company made no deliveries whatever. Attachment of funds in the hands of the Halmer Coal Mining Co., said to be due the Republic company, is sought.

Brookville, Penn.—One of the largest sales of an operating mine in Jefferson County it is expected will be consummated Mar. 30. The Stewart Coal Co. has made an agreement of sale of its Timblin mine for the sum of $125,000, the purchaser being the New York "World." The mine will continue in operation. The coal is to be shipped to the plants that manufacture newsprint paper for the "World." This newspaper has two pulp mills, one located in the Adirondacks and the other in Canada. The Timblin mine is one of the best equipped in this part of the state. It employs about 125 men, the daily capacity being 500 tons.

Johnstown, Penn.—A consideration of $1,100,000 in cash, stocks and bonds is involved in the purchase by E. F. Saxman, of Philadelphia, of the Robindale mine at Seward, Indiana County, from the Conemaugh Smokeless Coal Co. The deal includes 2000 acres of coal, the improvements including a modern shaft and slope and necessary electrical machinery and about 40 houses, together with the superintendent's house. The store building and stock of the Robindale Supply Co. was also purchased, the consideration being about $50,000. Mr. Saxman was formerly vice-president of the Ebensburg Coal Co. His son, Marsielles Saxman, it has been announced, will have charge of the new operation at Seward.

St. Louis, Mo.—Reports of the sale of the Wabash, Chester & Western R.R. in southern Illinois are believed to have a connection with efforts of representatives of the French government to close a contract for the delivery of 5,000,000 tons of Franklin County coal to that government every year until 1923. The plan, it is understood, is to ship this coal to France by the Iron Mountain R.R. to Galveston. The Iron Mountain now has only one branch line into the Franklin County field and it is congested. The Wabash, Chester & Western would give the Iron Mountain another road into the field and it is reliably stated that officials of the Missouri Pacific and Iron Mountain have been inspecting the W., C. & W. with the object of adding it to the system.

Market Department

GENERAL REVIEW

Full summer discount on anthracite domestic sizes. Steam grades will not be covered with contracts. Sharp break in the bituminous spot market, but contract prices are showing a stiffer tendency. Heavy stocking early in the season anticipated. Middle Western market holding steadier than other sections.

Anthracite—The announcement of the full spring discount of 50c. per ton by the Reading Co. the early part of the week occasioned some surprise, it being thought by a good many that a discount of only 25c. would be made. However, as pointed out in this column on several occasions, it is likely that the hard coalers will look to the steam sizes for their chief profits during the coming year, and in this connection it is significant that the Reading Co. has announced further that there will be practically no discount on these grades; of still greater significance is the fact that this company, contrary to its established custom, is contracting for none of its steam sizes. In view of the fact that the opening of the new coal year finds the tremendous storage reserves of the big companies completely exhausted for the first time in years, and also because of the frequent scares the public has had concerning its supplies during the past winter, it is reasonable to expect that April will see a very active business.

Bituminous—The first important break of the season has developed in the soft-coal market; our table of comparative prices showing a violent decline of 45@50c. for the week. The recent very urgent demand has disappeared, supplies now being sufficient to meet at least all the immediate requirements, and offers made by buyers a few weeks ago would now be eagerly accepted by the producing interests. Contractors are now more nearly meeting their obligations, and a few speculators have been caught in the slump, though for the most part it has been generally anticipated. There is still enough uncertainty in the situation, however, to cause considerable uneasiness. It is obvious that production will have to be maintained at maximum level to meet requirements, and the general unrest among the miners, together with the possibility of heavy drafts on the mining regions for military service are well-founded reasons for anxiety on the part of consuming interests. It is also understood that government agents have been investigating the extent to which West Virginia operators are committed on contracts which would indicate the possibility of having to meet extra demands from that source.

Lake Trade—The sentimental effect of the warmer weather, supplemented by a slightly better rail movement has caused a definite easing up in the market, Pittsburgh district prices, for instance, declining about 25c. to what is nominally considered the contract level on 12 months' business from Apr. 1. The softening in prices has been rather uneven, especially as regards the domestic grades; there is a natural tendency to delay buying on these since there is no longer any urgent demand, though, on the other hand, a good many dealers are laying plans to accumulate large stocks as early as possible. With the great shortage at the upper Lake ports, a very heavy movement is anticipated in that direction this season. The contract level in the Pittsburgh district is nominally $3.50, though there is practically no business being done on this basis, operating interests being firm in their belief that they will be able to obtain better prices in the open market.

Middle West—The market continues generally very firm, with prices at an abnormal level, though some weak spots have developed where restrictions on car movement have resulted in excessive tonnages being diverted to those points. The extraordinary demand, due to the high pressure in manufacturing circles, continues unabated, and is maintaining prices in an impressive manner. In addition to this, dealers are beginning to go into the market, and it is evident that they will accumulate very heavy stocks this summer. The heavy demand for Eastern coal in that section means the withdrawal of almost the entire tonnage of that grade from this market. Prices generally are ruling fully 50% above the level at this time last year. Contracting is progressing very slowly, buyers and sellers both hesitating to commit themselves.

A Year Ago—Continuance of operations at anthracite collieries causes a break in the market. Numerous uncertainties in bituminous create a mixed situation. Exports heavy. Lake shippers anxious for the opening. Middle Western market softer, and production heavily curtailed.

Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 12 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

Boston	Year Ago	Mar. 31	Mar. 24	Mar. 17
Clearfields	†$1.40@1.75	$4.50@4.25	$5.75@6.00	$5.90@6.75
Cambrias and Somersets	1.55@2.00	4.90@5.50	5.25@6.00	6.15@7.25
Pocah. and New River[1]	*2.75@2.85	5.50@6.00	7.00@7.25	7.00@7.25
Philadelphia				
Georges Creek (Big Vein)	*2.00@2.10	5.75@6.00	6.25@6.50	6.25@6.50
W. Va. Freeport	*1.30@1.35	4.75@5.00	5.50@5.75	5.50@5.75
Fairmont Gas mine-run	1.40@1.50	5.00@5.25	5.25@5.50	5.50@5.75
Pittsburgh (steam coal)[2]				
Mine-run	*1.15@1.25	3.50@3.75	3.75@4.00	4.00@4.25
¾-in	1.25@1.40	3.50@3.75	3.75@4.00	4.00@4.25
Slack	1.10@1.15	3.45@3.55	3.70@3.80	4.00@4.25
Chicago (Williamson and Franklin Co.)[2]				
Lump	1.50@1.75	3.75@4.00	3.75@4.00	3.50@3.75
Mine-run	*1.20@1.25	3.00@3.25	3.00@3.25	3.00@3.25
Screenings	.95@1.00	2.75@3.00	2.75@3.25	2.75@3.25
Gross average[3]	*$1.46@1.61	$4.20@4.44	$4.64@4.94	$4.80@5.19

Gross Averages		
Nov. 18	$4.78@5.21	
Nov. 25	4.80@5.33	
Dec. 2	4.71@5.17	
Dec. 9	4.69@5.15	
Dec. 16	4.48@4.90	
Dec. 23	4.67@5.08	
Dec. 30	4.73@5.19	
1917		
Jan. 6	5.16@5.53	
Jan. 13	4.74@5.11	
Jan. 20	4.54@4.98	
Jan. 27	4.64@5.03	
Feb. 3	4.66@4.86	
Feb. 10	4.70@4.95	
Feb. 17	4.67@5.04	
Feb. 24	4.95@5.29	
Mar. 3	5.10@5.48	
Mar. 10	5.36@5.61	

[1] F. o. b. Norfolk and Newport News. [2] Per net ton. [3] The highest average price made last year was $4.80@5.33 made on Nov. 25. * Price lower than the week before. † Price higher than the previous week.

BUSINESS OPINIONS

Iron Age—Steel makers are in conference and the prices at which products will be supplied to the Government are under discussion. Without regard to the concession which will be made, it is to be remembered that the total consumption for Government purposes does not bid fair to exceed 2 per cent. of the country's productive capacity. Much of it, of course, will get first attention, and by that fact penalize domestic consumers in respect to delivery and price. Domestic buying has been of no inconsiderable magnitude in the last few weeks.

American Wool and Cotton Reporter—Quietness but strength continues in the wool market, generally speaking, but big business is expected within a few weeks. The trade is waiting to see what will happen Apr. 2, when Congress convenes. The majority feel that the limit of prices has not by any means been reached yet. It is argued the prospects of getting a considerable quantity of wool from Australia, if war is declared between this country and Germany, seems good.

Dun—Neither legitimate business nor speculative markets have been disturbed by the recent significant events in the foreign situation. In producing and distributing channels, as in banking circles, caution continues general and many interests are still waiting, but there is no lack of the confidence which is essential to the economic welfare of the nation. That activity has abated in some branches in about all sections is not surprising, in view of the unexampled rise of prices and the limits to which the buying movement was previously carried, and nearly everywhere commitments for the far future are undertaken with prudence. Commercial failures this week are 294, against 269 last week, 255 the preceding week and 380 the corresponding week last year.

Bradstreet—Though streaked with evidences of conservatism as regards distant buying, trade currents tend to run more freely, and certainly superabundant activity reigns in most of the leading industries. Suspense incident to fears of a strike on the railways has been lifted, and while the imminence of war with Germany prompts some interests to mark time and others still to be chary about granting credits, there is, nevertheless, the ever present fear of a shortage of goods.

Dry Goods Economist—This has been a remarkable week. Since our last review was written the railroad strike, by agreement between the roads and the union, has been wiped from the list of threatened obstacles to trade. In upholding the Adamson law the United States Supreme Court has decided that Congress has the right to fix the hours of labor for railroad employees and therefore for employees in many other fields, and has furthermore declared that the right of railroad employees to strike is limited by the public interest.

Marshall Field & Co.—Current wholesale shipments of dry goods are running in excess of the corresponding week of a year ago. Road sales for immediate delivery are ahead of the same period last year, but sales for fall are showing a slight decline due to much earlier buying than a year ago. Collections are better than in the same week of 1916. The cotton goods market continues firm.

CONTRACT PRICES

Philadelphia—Consumers are making urgent efforts to cover their requirements but the amount of business closed is small, as shippers have apparently contracted for as much as they propose obligating themselves for. Contract prices continue to range from $3.25 to $4 for the best grades, with some off qualities being closed as low as $2.90. In anthracite circles the most significant development of the week has been the refusal of the Philadelphia & Reading Coal and Iron Co. to quote new contract figures on steam sizes.

Hampton Roads—Contract quotations range from a minimum of $3 to between $3.25 and $3.50 for Pocahontas and New River mine-run. The minimum bid on the city contract for Richmond, Va., was $3.25 per net ton on gas coal and $3.50 for steam coal. On a bid for furnishing the United States Engineers with 700 tons of coal during April, the minimum was on a basis of $5.50 per ton f.o.b. Norfolk, for high volatile coal.

Pittsburgh—Contract prices are nominally quoted at $3.50 per ton, but with very few sellers, the best opinion being that spot prices will rule above that level. A great many expiring contracts have been continued with the understanding that prices would be fixed each week according to market conditions. Considerable Lake coal has been contracted for, but prices are to be determined later.

Columbus—It is understood that the Norfolk & Western R.R. has closed contracts for approximately 1,300,000 tons for delivery during the next three years. Lump, mine-run and slack are uniformly quoted at $2, and contracts of eastern Ohio coal for Lake shipments are quoted at $2.75 and $3, while on some the price is left open to be fixed later.

Cleveland—Consumers are pushing hard for tonnage, and a number of contracts have been reported closed, with Pittsburgh No. 8 operators at prices ranging from $2.50 to $3 f.o.b. the mines.

Lake Freights—Arrangements have been concluded for the transportation of a quarter of a million tons to Lake Superior points on a basis of 50c. a ton which compares with several contracts closed a few weeks ago at 45c. per ton, though this rate applied only to docks having faster unloading facilities.

Chicago—The recent offer of operating interests to furnish the Chicago, Burlington and Quincy R.R. with one million tons for storage purposes at $2 for mine-run coal has been withdrawn. The best offer made by the road was $1.75. Contract prices are around $2 to $2.25 for screenings, and not less than $2.50 on prepared sizes for steam consumption.

St. Louis—A contract has been closed covering the various plants of N. K. Fairbank, involving 600,000 tons of Williamson and Franklin County coal at $2 at the mine. The Chicago & Carterville Coal Co. is understood to have sold the entire output of "B" mine, involving 1800 to 2000 tons per day to the Burlington R.R. at $2 per ton for mine-run. A number of smaller contracts have also been closed, though both buyers and sellers are showing a marked tendency to delay negotiations. The consuming interests seem to be confident of obtaining lower figures later, while producers on the other hand are marking their prices up higher if anything.

Atlantic Seaboard

BOSTON

General slump in spot prices and current quotations are materially less. Pennsylvania grades continue to recede in price. "Independent" anthracite quoted close to the March circular of the larger companies.

Bituminous—Small accumulations on the part of the less prominent agencies at Hampton Roads and a general slackening of urgent demand have caused a marked recession in spot prices this week. Pocahontas and New River are in sufficiently better supply to dull the edge of the market and offers that were made by buyers a week ago would now be eagerly accepted. There is the same shortage of boats, however, and few buyers are in position to dump coal at short notice. Contractors are getting more dependable as to supply and the demand for small lots that was so acute at times in order to clear ships has practically subsided. A few speculators have been caught by the spring-like softness but for the most part the slump was not unexpected, in view of the lack of Government purchases.

The spot demand locally is still strong but only on small lots for inland delivery. The severe season has caused most of the steam-users to need larger supplies than their normal requirements, and as a result the shippers and distributors have kept them on a hand-to-mouth basis while the old low prices are still effective. Stocks are very low indeed. With a better volume moving to Tidewater and the beginning of the new contract year so near at hand it is likely that the spring will show somewhat accelerated deliveries.

Little is heard now on the subject of season contracts. No buyer cares to make commitments f.o.b. loading port unless his marine transportation is firmly in hand. On the other hand no agency is anxious to name delivered prices because of the great uncertainty of water freights. Those consumers dependent upon light draft boats are in very awkward position, and furthermore they are practically restricted to the very few factors in the local market who are equipped to rehandle large cargoes into lighters. Small dependence is to be placed upon the owners of small barges, so many of which have lately been released from the anthracite trade. The owners are out for the cream of current rates and are not at all susceptible to season contracts. The terms for loading are so exacting that few buyers would have the hardihood to speculate on the coal materializing within the appointed time, taking the year as a whole.

At Portland and points further east like Searsport the shortage is as serious as ever and prices have not yet sagged; $11@12 is being quoted, although it must be remembered that when spring weather reaches that part of the territory and a few cargoes arrive the situation will change very materially. Ten days ago the temperature in this region was close to zero, and a week hence it may be 50°. A change of that character is bound to assuage anything like a panicky demand for fuel.

Certain of the Georges Creek shippers are again resorting to Hampton Roads loading in the effort to make deliveries. A few tows are going through to Baltimore, but all shipments are confined to contracts.

Prices on the Pennsylvania grades continue to ease off from the high levels of a few weeks ago. Car-supply is slightly improved and contractors are making better deliveries. This disposes of the extra urgent demand, and from now on the market all-rail at least is likely to be in easier shape. A lot of coal will have to be mined, however, before prices recede to the level on which contract business was taken in January.

Operators in the Pennsylvania districts are apprehensive of renewed troubles over the wage scale. This is a very important element in the near future of the market. Some go so far as to say that there will be a break in present negotiations and that there will be sharp bidding-up on prices the moment conditions are known to the general public.

Buyers in this territory show their customary hesitancy in making purchases. The feeling is so general that prices are bound to slide off very materially that it is next to impossible today to make sales of coal on present quotations when the fuel is not to be used in the immediate future.

Bituminous at wholesale is quoted about as follows, f.o.b. loading ports at points designated per gross ton:

	Clearfields	Camb. and Somerset
Philadelphia	$5.75@6.50	$6.15@6.75
New York	6.00@6.75	6.40@7.00
F.b. mines	4.50@5.25	4.90@5.50
Alongside Boston (water coal)	8.00@8.75	8.50@9.00

Pocahontas and New River are quoted at $7.50@6 f.o.b. Norfolk and Newport News, Va., for spot coal, and $10@10.50 on cars Boston or Providence for inland delivery.

Anthracite—April prices were announced this week by the Philadelphia & Reading Coal and Iron Co., a reduction of 50c. from the circular effective Nov. 1, 1916, on egg, stove and chestnut. The following is the new circular f.o.b. Port Richmond piers, Philadelphia, for shipment beyond the Capes of the Delaware: Egg, $4.85; stove, $5.10; chestnut, $5.15.

The local dealers are still very low on coal, and are unable to make more than hand-to-mouth deliveries. The public will naturally expect a reduction in retail prices and this will probably be forthcoming as soon as coal on the new basis is received. Meanwhile, speculative coal is being scaled down in price from day to day. The demand is lighter all-rail, now that warmer weather is in prospect, and water deliveries are still hampered by the high rates on marine transportation.

NEW YORK

Reading Co. announces the usual spring discount on domestic sizes. Premiums for domestic coals disappear and shippers cut circular to save demurrage on loaded boats. Consumption falls off but buckwheat coals hold firm. Bituminous operators await outcome of threatened trouble. Government agents reported in West Virginia mining regions.

Anthracite—The first announcement of the spring discount on the New York Tidewater prices for anthracite came from the local offices of the Philadelphia & Reading Coal & Iron Co. on Tuesday of this week and provided for a discount of 50c. from the winter circular for egg, stove and chestnut sizes, to take effect Apr. 1, making the new prices $4.95 for egg, $5.20 for stove and $5.25 for chestnut at the docks. As usual, 10c. per ton is to be added monthly for five months making the winter schedule effective on Sept. 1.

No announcement was made regarding broken, pea, or any of the buckwheat sizes, it being said that nothing definite had been decided upon. The Reading company's announcement caused some comment in the trade it being generally believed that the discount allowed by any of the companies would not exceed 25c., but it was expected that the other companies would make similar announcements later in the week.

Buying for immediate needs has fallen off and likewise premiums for individual domestic coals. Shippers had all they could do to dispose of their stocks at company circular and frequently it was necessary to cut these 25c. to get rid of loaded boats to save demurrage charges.

Stocks at the New York Tidewater docks are low. The large companies are better able to take care of their trade and this causes a falling off in the demand for the independent product. Stove and chestnut are more plentiful than egg, and holders of loaded boats of these sizes have let them go at less than circular to save demurrage costs. Egg coal was scarce. Pea coal was in good demand and premiums of from 50 to 75c. are obtainable for quick shipment.

The steam coal situation continues to be a source of worry to shippers. Buckwheat No. 1 sells the same as pea, while good premiums are obtainable for rice and barley. Individual boiler is not to be had. Some small tonnages of the buckwheat coals, on contract, were reported as having been closed at $3.50 for buckwheat No. 1, $2.50 for rice and $2.25 for barley, at the mine.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$4.95	.....
Egg	5.45	$5.35@5.45
Stove	5.70	5.60@5.70
Nut	5.75	5.65@5.75
Pea	4.00	4.50@4.75
Buck	2.75	4.50@4.75
Rice	2.20	3.50@4.00
Barley	1.95	2.50@3.00
Boiler	2.20	.....

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—The market lacks action. Demand is slow but prices hold firm, although not as strong as last week. Operators were anxious this week as to the outcome of the Du Bois convention held on Monday and the convention to be held later in the week in the Clearfield region. Quotations for the week show many changes depending upon supply and demand, although the price changes did not vary more than 25c. at any time. On one day some shippers were quoting high grade coals at $7.25 at the docks, while the same grades were bringing from $5 to $5.25 at the mines.

Free coals are scarce. Operators are not making heavy shipments to Tidewater, being unwilling to take chances on the outcome of present conditions. It was said that Government agents have been sounding operators in the West Virginia districts as to what percentage of their output is tied up in contracts and to learn, if possible, what tonnages the Government can expect should occasion arise.

The railroads are buying freely and are looking for more contracts but operators are slow to bind themselves for more than 50 per cent. of their production. The roads are said to be willing to sign up at from $3.50 to $3.75 at the mines. Small tonnages for summer delivery, that is, up to Sept. 1, are said to have been signed up at $2.75 at the mines, by individuals.

There is a good call from New England and Long Island water points, but transportation is slow and rates high.

Car supply remains bad and the average of the mines is near 40 per cent.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

	Port Reading	South Amboy	Mine Price
George Crk.			
Big Vein	$7.25@7.50	$7.25@7.50	$5.25@5.50
Tyson	7.00@7.25	7.00@7.25	5.25@5.50
Clearfield	6.75@7.25	6.75@7.25	5.00@5.25
South Frk	.....	7.00@7.25	5.25@5.50
Nanty Glo	.....	7.00@7.25	5.25@5.50
Som'r. Co	6.75@7.00	6.75@7.00	5.00@5.25
Que'ho'ing	7.00@7.25	7.00@7.25	5.25@5.50
W. V. Fa'rm't			
Th'r'qua	6.75@7.00	6.75@7.00	4.75@5.00
Mine-run	6.75@7.00	6.75@7.00	4.50@4.75
West. Md.	6.75@7.00	6.75@7.00	4.75@5.00

PHILADELPHIA

Announcement of the new circulars showing the usual discount of 50c. occasion surprise, particularly on pea coal. Salesmen out again. Dealers plan to stock heavily. Pea in strong demand, with small supplies on hand. Shortage of steam coal. Bituminous prices drop on all grades, although not as much as expected. Car supply unimproved. Not much contracting.

Anthracite—The announcement of the spring prices, showing a discount of the full 50c. per ton on the domestic grades, came as a big surprise to the trade, and particularly to the individual operators who were looking forward to some very handsome profits. While the companies would undoubtedly have wished to benefit by existing market conditions to enhance their profits, it seems that they did not consider it advisable. The reduction on pea coal was the greatest surprise, but the whole situation bears out our statement of some time ago that the hard coalers would probably look to the steam sizes for their big profits during the coming year.

The new circular provides for the usual summer discount of 50c. per ton, effective Apr. 1, making prices for shipment that month as follows: Egg, $3.65; stove, $3.60; nut, $4; pea, $2.30. Following the usual practice, the discount will be eliminated at the rate of 10c. per month until the full winter circular is in effect as follows: Egg, $4.15; stove, $4.10; nut, $4.50; pea, $2.80.

The last week of the month saw such a reversal of business conditions respecting the domestic sizes that there was some doubt as to the mines making full time owing to lack of orders. With all prospect of severe weather past the dealers here practically cancelled all their orders for the prepared sizes, such as egg, stove and nut. There has also been quite a little coal of these sizes refused, as many shippers in order to move their production filled orders which had been on their books for months.

It is quite probable that much coal has been forwarded to the various tidewater ports such as Port Richmond, Port Liberty, Port Reading, Elizabethport, etc., for reconsignment promptly on Apr. 2 after the new prices go into effect.

The dealers here seem determined to go into April with as little egg, stove and nut as possible. The trade is already assured of the 25c. freight reduction in addition to regular discount of 50c.

The leaders in the trade are considering ways and means of appealing to the public to buy their next winter's coal during this spring and summer. They hope to make the practice more general than ever before by persuading every consumer who is able to buy to store all the coal he can at this time. Without the immense amount of storage coal on hand the past winter this market would have had a coal famine, and the shippers will be absolutely unable to again accumulate the millions of tons above ground by next fall and winter. Then also with the country on the brink of war reports come from the mining region of the young men showing patriotic enthusiasm which can only add to the labor shortage there.

With the slackening of the demand for prepared sizes the salesmen of the mining companies swarmed out this week, not so much with the hope of selling coal as they were in trying to get their customers to place orders for April. Quite a number of orders of this kind were obtained, as there is no doubt that they expect to do a heavy spring business and are determined to commence buying early and to carry capacity stocks from April on if they can secure the coal.

Some interests profess to believe that even with the usual 50c. spring reduction shipments to this market will be quite light for at least the first month, or perhaps for a short while longer. There is not the least doubt that both New England and the West are determined also to fill up at this time and it is believed they will be given the bulk of the shipments for the next six weeks.

Contrary to their usual procedure at this time of year it is probable the price cutters will maintain regular schedules. Some of the largest dealers have stated that even if their smaller competitors do fall back into their old habits, they will make no effort to meet them but will hold their coal for the full market prices.

In the wholesale market premium prices on prepared sizes have entirely disappeared during the past ten days and shippers are glad to move coal to any point at circular. On pea coal it has been different, however, and local dealers continue to pay from 50c. to 75c. above circular. There is really less pea coal in the city at this time than there has been all winter and in several sections of the city the retail price continues to run from $6.25 to $6.75 per ton. There is an especially heavy demand for pea now, as the consumers are just trying to piece themselves out until warm weather arrives and will not accept the larger sizes as a substitute now.

The steam coal situation fails to improve. Buckwheat coal is scarce and is bound to continue so. It is reported that one of the railroad companies entering the hard coal region will this year alone consume a million tons more of buckwheat than last year, owing to the high price of bituminous. They will also naturally increase their use of the smaller sizes in the same ratio.

The Reading have announced the same prices for steam coal as have prevailed all winter with the exception of boiler, which is to be $1.80 or a reduction of 15c. The Reading has also decided that they will do practically no contracting on steam sizes, which is something very unusual.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken	$4.25	$5.40	Buck	$2.50	$3.40
Egg	4.15	5.25	Rice	2.10	3.00
Stove	4.10	5.60	Boiler	1.80	3.00
Nut	4.50	5.55	Barley	1.85	2.05
Pea	2.80	3.70			

Bituminous—Following the settlement of the railroad labor troubles the prices of all grades fell off, though not as much as had been expected, considering the frenzied buying just previous to the adjustment, when everybody was endeavoring to stock as heavily as possible. The heaviest declines were in the better grades of steaming coals and amounted to 50@75c., while some of the other fair grades only ran off about 25c. a ton. While it is altogether likely that there might be further slight recessions, no one in the trade expects anything but comparatively high prices to rule right through the summer.

There has been a fair supply of cars in the Fairmont region lately, but the reports from the Pennsylvania districts have been quite discouraging and a large proportion of the loadings have been on account of railway supply fuel. In addition there are once more well-defined rumors of unrest among the miners which may result in additional disturbance from that source.

Slack coal continues to be in most unusual demand and shippers in taking orders are reserving the right to ship run-of-mine, with the result that prices of these sizes are on a parity.

Consumers this week displayed particular interest in securing contract protection and the offices have been flooded with requests for quotations of this kind. However, the volume of business closed has been very small, as it seems that most shippers have taken about all of this business that they intend to obligate themselves for, but even at that every now and then they are sometimes prevailed upon to squeeze in an additional thousand tons or so. The contract prices continue to run from $3.25 to $4 for the very best coal, with some business on ordinary grades closed as low as $2.90.

The prices per gross ton f.o.b. cars at mines are as follows:

Georges Creek Big Vein	$5.75@6.00
South Fork Miller Vein	5.75@6.00
Clearfield (ordinary)	5.25@5.50
Somerset (ordinary)	5.25@5.50
West Va. Freeport	4.75@5.00
Fairmont gas lump	5.25@5.50
Fairmont gas, mine-run	5.00@5.25
Fairmont gas, slack	4.50@4.75
Fairmont lump, ordinary	4.75@5.00
Fairmont mine-run	4.50@4.75
Fairmont slack	4.50@4.75

BALTIMORE

Spot prices at tide continue a dollar or more above the mine basis, though the market is much softer. Hard coal dealers stocking up to some extent.

Bituminous—The market is softer, but the small deliveries at tide have kept prices for spot fuels here considerably above the accepted quotations for delivery. For instance highest grade steam coals are being quoted at the mines at about $4.50, while the same grades here bring about $5.75 to $6 on a mine basis. Good steam coals are now occasionally offering at the mines at around $4 and gas coals are about the same. Only the comparatively light demand here has prevented prices going higher again in the face of the light movement from mines to tide.

Quotations at the mines for delivery to the trade are about as follows: Georges Creek Tyson, $4.75; Somerset, $4.25; Quemahoning, $4.50; Clearfield, $4.00 to $4.25; Freeport, $4.00; Fairmont gas, three-quarter, $4.25; run-of-mine, same, $4.00; slack same, $4.00.

Every coal man's desk is banked with contract offers. A few are being made, with the better grade coals around $4 for over the year delivery. The majority of coal men are holding their tonnage free, while some are making small contracts, but only to their oldest customers. The big problem now is how will the mines be able to maintain production if great quantities of men are called away for army service.

Anthracite—Warm weather has knocked the bottom out of the anthracite demand here. Yard supplies have been pretty well depleted, however, and coal men are making efforts to stock up to some extent. The uncertainty in transportation when heavy troop moving begins may be a decided factor in fuel supplies shortly.

HAMPTON ROADS

Improvement in car supply and movement. Slightly easier tone to spot market. Contract quotations firm. No stocks at Hampton Roads.

Some improvement is noticeable in both car supply and the movement from the mines, though the situation leaves much to be desired. Probably on this account there seems to be a slight softening of spot prices. Shippers say this is only temporary, however, and that the market will advance again shortly.

Contracts are still quoted around $3 per net ton f.o.b. mines, this being the bottom most shippers are willing to accept for future delivery. Bids received by the City of Richmond, Va., for gas coal were from $3.25 per net ton f.o.b. mines up and for steam coal $3.50 and up. Bids opened by the U. S. Engineers for 700 tons for delivery during April were on the basis of $5.50 f.o.b. Norfolk for Thacker mine-run, a high volatile coal. Increased demand exceeds the better supply received from the mines recently and therefore no stocks have been accumulated.

The Panama R.R. is arranging to convert the colliers "Ulysses" and "Achilles" to oil burners; this will cause a loss of 60,000 tons yearly to Hampton Roads shippers. The Palmer fleet of five-masted schooners has been reported sold at about $500,000; this fleet is well known in the coal trade and comprises the "Singleton Palmer," "Dorothy Palmer," "Hardwood Palmer" and "Jane Palmer."

There is considerable uncertainty in the trade regarding the result of the opposition to the proposed increase in freight rates to Hampton Roads. The principal complaint is that there will not be a corresponding increase in the rate to Baltimore, thus further increasing the differential against Hampton Roads.

Prices for prompt delivery are about $6.50@7 for Pocahontas and New River run-of-mine for coastwise and export shipment; $7@7.50 for bunker coal plus 15c. trimming; $6.50 per net ton for local delivery. Anthracite $9 per net ton delivered. Contract prices for Pocahontas and New River run-of-mine for the year beginning Apr. 1, range from $3.25 to $3.50 per net ton f.o.b. mines. High volatile quotations are slightly below these prices.

Dumpings at the Hampton Roads piers for the past several weeks were as follows:

	Mar. 3	Mar. 10	Mar. 17	Mar. 24
Nor. & West	100,118	112,618	160,247	150,654
Ches. & Ohio	122,483	94,423	124,166	102,418
Virginian	127,902	77,982	84,747	89,038
Total	350,503	285,023	369,160	342,110

Ocean Shipping

COASTWISE FREIGHTS

A 5000-ton steamer is reported to have been chartered for a single trip from Norfolk to Portland at $4.25, and that is an indication of the freight market today from Hampton Roads. On the other hand the Government accepted a recent bid on freighting 10,000 to the coaling station at Melville, R. I., from Hampton Roads at $3.75, five days to load and discharge, demurrage 25c., dispatch 7½c.

Rates on Long Island Sound, New York, loading are fairly easy at $1.15@1.25; $1.75 is quoted on similar tonnage to Boston and $3 has lately been paid on small vessels to points like Eastport, Me.

OCEAN FREIGHTS

Freight conditions are practically the same as a week ago, and although we have chartered numerous steamers for export coal during this period, none of them have been reported.

We would quote freight rates on coal by steamer as follows:

	Mar. 19	Mar. 26
Europe		
West Coast Italy	$50.40@57.60	$55.20@62.40
Marseilles	50.00@55.20	55.20@62.40
Spanish ports*	22.80@27.60	22.80 about
Spanish ports (At'ic)		27.60

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

South America	Mar. 19	Mar. 26
Montevideo	24.00@25.20	25.20@26.40
Buenos Aires	24.00@25.20	25.20@26.40
Rosario	26.40 about	27.60 about
Rio Janeiro	[3]20.00 about	[3]20.00 about
Santos	[3]21.00@22.00	[3]21.00@22.00
Chile (good port)	15.00@16.00	16.00@17.00
West Indies		
Havana	5.00 about	5.00 about
Cardenas, Sagua	7.00 about	7.00 about
Cienfuegos	7.50 about	7.50 about
Port au Spain	10.00 about	10.00 about
St. Lucia	10.00 about	10.00 about
St. Thomas	8.00@9.00	8.00@9.00
Barbados	10.00 about	10.00 about
Kingston	7.25 about	7.25 about
Curacao[1]	8.00 about	8.00 about
Santiago	7.50 about	7.50 about
Guantanamo	7.00 about	7.50 about
Bermuda	7.00@8.00	7.50 about
Mexico		
Vera Cruz	8.50@9.00	8.50@9.50
Tampico	8.50@9.00	8.50@9.50

* Spanish dues for account of cargo. [1] And p.c. [2] Or other good Spanish port. [3] Net.

W. W. Battie & Co.'s Coal Trade Freight Report.

Lake Markets

PITTSBURGH

Car supplies moderate. Spot prices off 25c. Contract offerings light. Miners restive, seeking a bonus.

Car supplies the latter part of last week were very irregular, on different days and at different mines, but on the whole showed a slight improvement over the average. Friday was a very poor day. This week opened with rather poor supplies, although there was an improvement on Monday as compared with Monday of last week, which was an exceptionally poor day. Car supplies in general are estimated to average 50% of allotments, but of course this means somewhat more than 50% of requirements, as it is certain that more than 50% of the requirements are being filled, otherwise industry would almost stop.

The spot market is down about 25c. in the week, and on the whole is described as low, i.e., compared with prices lately ruling. It is approximately level with the views entertained as to the contract market for the twelvemonth period beginning Apr. 1. The common view is that the spot market will be easy until Lake navigation opens, ruling perhaps at an average below to-day's market, that there will be a stronger market when Lake shipments get in full swing and that there will be a great scarcity towards the close of Lake navigation.

While $3.50 is being quoted on contract by a few sellers, it seems to be the general opinion that spot prices will average higher than that. The majority of sellers are refusing to make contracts. The expiration of a number of contracts has been arranged for by an understanding that shipments will be continued, according to the buyer's requirements, a price to be fixed each week according to market conditions then current. While there is a quotable price of $3.50 on twelvemonth contracts there is no knowledge of any price having been fixed as to any Lake coal, though much has been put under cover subject to subsequent determination of price.

The miners are becoming still more restive and are endeavoring to get the operators to agree to pay them a bonus while present conditions last, as they feel the present scale, having still a year to run, does not fit present conditions. In some quarters it is claimed the operators would be more ready to fix contract prices were it not for the effect this would have upon the attitude of the miners.

We quote spot coal at $3.50 for slack, $3.50@3.75 for steam mine-run and $4@4.25 for 3-in. gas, and $3.50 on contract for the twelvemonth beginning Apr. 1, all per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous more plentiful and prices slacking off. Prospect of better car supply. Anthracite catching up.

Bituminous—The open weather has put an end to the delays from snow blockades, although there are still reports of ice and snowbanks in the northern parts of the state. Even yet there are numerous embargoes in force, especially toward Canada, and nothing like a free movement is looked for right away.

The slacking off in prices has taken place very unevenly. Pittsburgh, Bessemer and Allegheny Valley hold up best, with No. 8 showing greatest weakness. No. 8 coal will now go heavily to the Lake trade, however. The Lake opening is now so near that it is bound to influence the bituminous trade from this time on, no doubt somewhat weakening the Allegheny Valley prices more or less, as that coal does not enter largely into the Lake business.

All bituminous prices are not only weak and declining, but so unsteady that no two jobbers quote the same, some of them differing a dollar or more. A fair average quotation is as follows:

Youghiogheny Gas	$4.50@5.00
Pittsburgh Steam	4.00@4.50
Bessemer	3.50@4.00
Allegheny Valley	3.25@3.75
Ohio No. 8	3.00@3.50
Cambria Co. Smithing	4.00@4.50
Pennsylvania Smokeless	4.15@4.65
All Slack	2.90@3.40
Cannel	5.00@5.50

All prices are per net ton, f.o.b. **Buffalo.**

There is some report of bituminous contracts going for less than $3 net for mine-run, but the jobber generally denies that any can be obtained for that and say that $3 is still a low price. The city has now sent out requests for bids on coal to supply the water-works (60,000 tons of bituminous) to be opened on Apr. 6 and after this date it will be known how near the consumer and producer are together on large amounts.

Anthracite—Buying has dropped off now, so that the shippers are becoming easy. They can soon begin to accumulate coal for the Lake trade and will do so, though the Canadian dealers and consumers are not yet well supplied. Still it will be quite a long time before the supply is as well distributed as it should be.

The prospect of liberal Lake shipments with the opening of the season is not very good. There is much need of a supply at all the upper ports, but the Lake fleet is not going to wait for coal; if it is not loaded in when the vessels have notice that it is possible to go they will go without it. Other freights are paying too good rates for any delay here.

Retail dealers complain of no winter profits. The snow was bad and there was so much delay and division of loads to keep everybody with some coal that the cost of delivery has been heavy. A good April trade will help them materially.

CLEVELAND

Car supply greatly improved. Lake shipments to start on or about Apr. 1. Consumers making efforts to cover their requirements.

The car supply on most of the Ohio coal roads has been very much better the past few days; in fact some of the operators report it the best they have had for some weeks. This has forced the local market prices down and also affected the price for direct shipments from the mines. All grades of Pittsburgh No. 8 coal were freely offered at $2.50 f.o.b. the mine, while spot coal was bringing $3.50 f.o.b. Cleveland.

In past years when there was no miners' scale to be adjusted, the month of March always showed a radical decline in prices and this is now appearing this year. However, conservative operators believe that the bottom has been reached and as shipments for Lake ports will start on or about Apr. 1, they look for a stiffening in prices after that date. One of the main reasons for this feeling is that the Northwestern docks are practically cleaned up and Lake shippers expect this season to break all records.

As the first of April approaches, consumers are exerting their best efforts to cover their requirements and a good many contracts have been reported made the past week by Pittsburg No. 8 operators at prices ranging from $2.50 to $3, net ton f.o.b. mine.

A new rule adopted by the Cleveland railroads a few days ago is going to affect the reconsigning of coal on track to a great extent. It provides a charge of $2 per car for all cars reconsigned the first two days after they arrive, which has been the free time allowed. For cars reconsigned after the two days expire, a charge of $5 per car will be made.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8	$3.50	$3.50	$3.50
Cambridge	3.50	3.50	3.50
Middle Dist.	3.50	3.50	3.50
Hocking	3.25	3.25	3.25
Pocahontas	....	4.50	....

DETROIT

Demand from steam coal users absorbs the tonnage released from the domestic trade. Lake shipper closes contract for the movement of 250,000 tons on Lake Superior.

Bituminous—Buying by factories, industrial plants and other consumers of steam coal continues in considerable volume absorbing all the coal coming in. In fact nearly all the coal coming to Detroit is sold either before leaving the mines or while on the way. Steam coal users are anxious to get slack, but larger sizes, including lump and egg are readily taken to make up deficiencies in the supply of fine coal. Little or no distinction is made in the price between the steam and domestic sizes. Slack, egg or lump from West Virginia and Ohio mines is quoted at $4.50 to $4.75 at the mines, lump and egg of the smokeless variety about $5 and West Virginia or Ohio mine-run $4.25 at the mines.

Domestic consumers are curtailing their orders in expectation of the warm weather and dealers do not appear inclined to buy more than is necessary to take care of their customers.

Anthracite—Interest in anthracite is waning, both on the part of consumers and retail yards.

Lake Trade—Efforts of Lake shippers to obtain additional vessel capacity, were successful during the week to the extent of placing a block of about 250,000 tons, which is to be moved from Lake Erie to ports on Lake Superior at 50c. a ton. Some contracts were closed several weeks ago on the basis of about 45c., but delivery was to be made at docks having quicker unloading facilities than those to which the 50c. rate is to be paid. The price of fuel coal to Lake steamers is not yet settled and until it is, there likely will be few additional charters in the coal trade.

COLUMBUS

Considerable activity in the coal trade. Steam business is good and much attention is being devoted to the contract situation.

The coal trade continues strong and active. Demand for both domestic and steam sizes is good and prices are fairly well maintained at the levels which have prevailed for some time. Car shortage is being improved and with it there is a large output at the mines. Coalmen look to the coming summer as one of the best markets in the history of the business in Ohio.

Domestic trade is better than usual for this time of the year, due to the disposition among retailers to stock up some. There is still considerable business with householders as the spring season has been quite cold. The stocking season is expected to be much earlier than usual. Retail prices are firm at former levels.

There is a good demand in all lines of the steam trade. Manufacturing plants of all kinds are buying actively, especially iron and steel plants which are rushed to capacity.

With the opening of navigation there will be a rush of coal to the Northwest. Lake prices are higher and another change is the advance in the Lake carrying rate. Then again the railroads have increased the freight rate on Lake coal from the Nelsonville collecting point to all Ohio ports by 15c. This tariff, filed with the Ohio Utilities Commission, to become effective Apr. 16, has not been contested as yet.

Production in most Ohio fields has shown an increase during the past week. The Hocking Valley is credited with about 85 per cent. of normal.

It is unofficially reported among operators and shippers that the Norfolk & Western R.R. has closed fuel contracts for approximately 1,300,000 tons to cover a period of three years. The coal is to come from the splint fields and also from the lower grade Pocahontas districts. The price for lump, mine-run and slack is fixed at $2. Contracts in the eastern Ohio field are being made for Lake shipment at between $2.75 and $3, although some of them have the price left open, the quotations at the time of the opening of the Lake trade to govern.

Prices on short tons, f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump	$3.25	$3.25	.....
Inch and a quarter	3.00	3.00	$3.00
Three-quarter inch	2.75	3.00	3.00
Nut	2.75	3.00	3.00
Egg	2.75	3.00	.....
Mine run	2.75	3.00	2.75
Nut, pea and slack	2.75	2.75	2.75
Coarse slack	2.75	2.75	2.75

CINCINNATI

Moderate weather eases up the spot market but pressure for contracting is stronger, with prices tending higher. Car supply very poor.

The spring season is on, and lack of pressure for spot domestic coal has resulted. The steam demand has also eased off somewhat, although the demoralized state of the car supply has held the market steady. There has been no improvement in the car situation, and mines are receiving only a fraction of their requirements, with little prospect of any material improvement in the near future.

Contracting is progressing very slowly, on account of the reluctance of consumers to pay ruling prices, on the one hand, and the refusal, on the other, of operators to make any concessions. It is anticipated that the early summer movement of domestic grades will be heavier than ever before, on account of the shortage last winter and this is expected to help the market generally. Contracts for mine-run for steam purposes are reported at $3 and upward, and operators are confident that there will be no reduction from this figure.

LOUISVILLE

Mild weather easing up demand for domestic grades and industrial demand somewhat lighter as result of previous efforts to stock up over threatened strike period.

A considerable lessening of the demand for coal has characteried the week in the Kentucky market. Arrival of mild weather has tended to eliminate the domestic trade to a large extent while industrial consumers who made strenuous efforts to stock coal in anticipation of a strike have not been as insistent as heretofore. A large volume of business is being handled, however, having been affected more by embargoes announced by the railways than most other conditions. Now that these have been or are being lifted the movement is heavier again.

Prices are softening. Eastern Kentucky, f.o.b. the mines, quotes block at $3.25@3.50; mine-run, **$3.25 and nut and slack, $3.50.** Western Kentucky prices are without important changes, although the market is still somewhat unsettled.

Contracts are being delayed for the most part, both operators and consumers being afraid of tying themselves up just at this time. Prices at which contracts, dating from Apr. 1, have been made are noted at from $2.50 to $2.75, for southern delivery, twelve months. A few contracts for northern shipment are noted at from $2.75 up to $3.25.

BIRMINGHAM

Inquiry good, and prices continue firm. Free coal scarce and railroads and industrial plants short on stocks. Domestic schedules issued. Car supply and labor shortage holding down the production.

While the demand for coal is not quite as insistent as it was during the previous two weeks, inquiries are in good volume, and brokers and operators report conditions satisfactory in this respect. There is ample business to more than adequately care for the supply and prevent any recession in prices. Some contracts are being closed from $2.25 to $3 per ton mines. One of the smaller railroads closed a contract during the week at $2 per ton mines, cancelling its old contract expiring July 1, 1917, and renewing for the sixteen months ending July 1, 1918. Figuring in the undelivered tonnage on the old contract the new price will average around $2.25 per ton. Spot prices are about as follows per net ton mines: Big Seam mine-run, $2.75@3; Carbon Hill, $2.75@3; Black Creek, Pratt and Cahaba, $3.25@3.50.

The domestic schedules effective Apr. 1 have been issued and prices are as follows per net ton mines for lump and egg coal: Big Seam, $2.25; Carbon Hill, $2.50; Cahaba and Black Creek, $3.25, and Montevallo, $3.50. Opinion among retailers as to the advisability of contracting for their winter's supply is divided, though it is believed that the majority will enter the market and secure their requirements. Domestic operators are very independent and will make no concessions in prices, as they can readily dispose of their product in the steam trade at equivalent figures.

There is increased complaint among operators in regard to shortage of labor and fear is expressed that this trouble will become more serious and acute with the coming of spring.

Coke

CONNELLSVILLE

Spot coke off. Sellers reserved as to contract. Production and shipments increasing.

The spot market is off somewhat, due to better supplies, though the furnaces are still not obtaining all the coke they need. Very few are banked, but many are forced to run slow occasionally. As to contract, it is claimed operators are more reserved than are consumers, though it does not appear that consumers are making any bids. There is some uncoverable consumption for the second quarter, but hardly any inquiry, while the second half is all in the future. Prices named here are largely nominal, based chiefly upon transactions some time ago. We quote: Spot furnace, $8.50@9 spot foundry, $11@12; contract furnace, nominal $7@8; contract foundry, $7.50@9 per net ton at ovens.

The "Courier" reports production in the Connelisville and lower Connellsville region in the week ended Mar. 17, at 358,079 tons, an increase of 8875 tons, and shipments at 356,684 tons, an increase of 6514 tons.

Buffalo—The prices have eased off about $2 a ton, though they are not yet low enough to allow a separate price for the low grades. The consumer is not at all sure of a liberal supply and is still paying $11.85 for Connellsville foundry and $9.85 for furnace. Not much contracting is being done.

Chicago—Shippers are trying hard to keep up with the accumulated demand for all grades of coke. Spot coke available is nil, and byproduct ovens are having difficulty in meeting contracts owing to shortage in car and labor supply. Some of the large Eastern coke operators refuse absolutely to discuss contracts.

St. Louis—The demand for Eastern and Southern shipments continue good with very little to offer for foundry and domestic. There is nothing to offer from the local plants and the local tonnage is shortening on account of fuel supply.

Birmingham—The demand for coke continues very active with prices to new customers firm at $12.50 per net ton ovens for foundry coke in the spot market. Producers are inclined to be a little more liberal with consumers who have been regular spot buyers and book their business at around $11. Contracts are closed at $9.50 to $10, dependent upon the tonnage and delivery specifications. Furnace coke is very scarce and no quotations are obtainable. Equipment for movement of the product is hard to obtain and district customers are finding it difficult to obtain their requirements regularly.

Middle Western

GENERAL REVIEW

Spot prices firm in face of mild weather. Buying very active. Interest centered on contracting.

Conditions are still abnormal with spot coal prices remarkably firm at a time of year when there is usually a decidedly easier tone. Indiana mines still have a shortage of cars and are operating on approximately a three-days-per-week schedule. In the Illinois fields, the car supply has improved, but there is an increasing shortage of labor. Notwithstanding the spring weather, spot coal brings the same prices as a week ago, and the demand for domestic sizes is steadily maintained. The general industrial prosperity seems to be holding up the demand for steam coal at unprecedented levels, and apparently it is to continue indefinitely.

Illinois operators have withdrawn their price of $2 on mine-run offered to the C. B. & Q. R.R. for one million tons of coal to be taken for storage, and the outcome of these negotiations is now uncertain; the road offered the operators $1.75 for the coal but this was refused. Illinois operators still show reluctance to enter into contracts on any large scale, and in fact a majority of the Franklin County operators have refused to take any contracts whatsoever. Retailers are making efforts to put a considerable tonnage in storage, and this coupled with the railroad and industrial demand is assisting in keeping steam sizes at high prices and had made the operators feel that contract obligations should be entered into very slowly. Illinois and Indiana operators are said to be maintaining prices of $2 to $2.25 under contract for screenings, and not less than $2.50 per ton on prepared sizes for steam consumption.

The Lake situation is still most uncertain, and dock managers have a very indefinite idea as to what tonnage they will be able to obtain during the coming season and prices which will prevail. The docks are nearly all asking $6 f.o.b. for standard grades of bituminous lump, and $5.40 for dock mine-run on open market orders. These prices will probably prevail Apr. 1, and will not change until there are new coal arrivals. Considerable railroad coal has been used in the Northwest from the Springfield district, which is said to have been bought at a price of $1.75 for lump.

ST. LOUIS

Car restrictions, forcing sales in limited territory making prices softer. Weather warm, cars plentiful and demand light. Wide variance between city and country prices.

Warm weather, a rather abundant car supply, and an attitude on the part of the buyer that the market is going to break has eased up conditions locally beyond what was expected. One of the principal factors in the breaking of the local market is the car restrictions imposed by the Iron Mountain lines whereby their equipment will not go north to Chicago or Northeast of St. Louis, excepting on the Iron Mountain and Missouri Pacific lines. This has thrown an enormous tonnage of high-grade coal on the St. Louis market and at the close of last week prices of $1.50 prevailed on screenings, $1.75 on nut, egg and lump, with mine-run at $1.50. The cost of producing coal in some of the mines in that territory is about $1.50 for mine-run.

Outside of St. Louis the demand for high grade has fallen off and very little is moving to the country or elsewhere. Many steam plants had a fair supply on hand for the expected railroad strike and they are using this up in an effort to beat down the market.

In the high-grade field cars have been plentiful the past week, perhaps about an 80% supply. In the Mount Olive field very little of this coal is moving in. A better market is obtained in the North and Northwest and some is still moving east. Coal from the Standard field is in much the same condition as high grade. Restricted equipment on the short lines and on the L. & N. is forcing the operators to give their coal away at slightly above cost in the restricted areas. Car supply in this field has been unusually good, running anywhere from 60 to 90%.

The only domestic demand in St. Louis proper is for small quantities of Standard, on account of the warm weather prevailing. Steam demand seems to be unusually light on everything, although business in a general way is far above normal. A small tonnage of smokeless came in on old orders, and approximately 80 cars of smithing moved in the past week or so on old orders and found a ready market.

Contracting still continues slow. The biggest contract of the past week was that of the Chicago & Carterville Coal Co., selling the output of its B mine in Williamson County for one year to the Burlington R.R., mine-run basis, at, it is understood, $2. This mine is producing about 1800 to 2000 tons per day.

Other small contracts are reported from the high-grade field for mine-run as high as $2.25 and as low as $2. Some small screening contracts have been let at from $2 to $2.25, and a few small contracts for steam lump, egg and nut at $2.50.

Very few contract prices are submitted and these generally call for screenings and mine-run at $2.25, with the other sizes at $2.50. In the Mount Olive field contracting is slow and quotations are not being made. Very few contracts have been made in the Standard field, and the following is representative of the trend of prices: 400 tons a month of 2-in. lump at $1.50 mine; 250 tons per month of 2-in. lump at $1.50; 100 to 125 tons per week of 2-in. screenings at $2; 100 tons a month of 2-in. lump at $1.32½ mines. This last contract moved in restricted equipment to St. Louis proper.

The prevailing circular for St. Louis with the exception, as above noted, per net ton f.o.b. mines is:

	Williamson and Franklin Co.	Mt. Olive and Staunton	Standard
6-in. lump	$2.00@2.25	$1.85	$1.40@1.50
3x6-in. egg	2.00@2.25	1.85	1.40@1.50
2x3-in. nut	2.00@2.25	1.85	1.40@1.50
No. 2 nut	2.00@2.25	.....	1.40@1.50
No. 3 nut	2.00	.....	.....
No. 4 nut	2.00	.....	.....
No. 5 nut	.....	.....	.....
2-in. screen.	1.50@1.75	1.75	1.10@1.25
2-in. lump	.....	.....	1.15@1.25
3-in. lump	.....	1.75	.....
Steam egg	1.75@2.00	1.75	1.15@1.25
Mine run	1.50@1.75	1.50	1.10@1.20
Washed			
No. 1	2.00@2.25	2.25	.....
No. 2	2.00@2.25	.....	.....
No. 3	2.00	.....	.....
No. 4	2.00	.....	.....
No. 5	1.50	.....	.....

CHICAGO

No easier tone in the Chicago district. Spot prices high. Eastern arrivals very scarce. Anthracite situation mixed.

Contracting in the Chicago district is still in the foreground, but Chicago wholesalers and operators show no disposition to push renewals. A few contracts have been closed for screenings at $2 and for steam lump at from $2.25 to $2.35. Retailers are storing more domestic sizes at this time of year than ever before, which has caused a rising tendency.

In the southern Illinois field increased buying has been seen from Northwestern territory and Michigan. Michigan buyers are trying to contract heavily for southern Illinois production but are not meeting with much success. A considerable volume of Carterville mine-run has been moving at around $2.75 to this territory. Saline County has been busy on contract business exclusively, and Harrisburg district has had no free coal to offer.

Springfield shippers are forwarding a considerable tonnage to Northern Illinois and Michigan points, and some Springfield lump has been sold to Northwestern railroads at as low as $1.65 per ton. Domestic trade in Fulton and Peoria Counties has relaxed, and steam business is lighter, but compared with this time last year prices are fifty per cent. higher for open shipments.

Free smokeless coal is limited. Current prices on mine-run average between $4.50 and $4.75, with lump and egg around $5. Spot bids as high as $4 have been offered for April deliveries of mine-run. Higher prices eastward seems to indicate that the smokeless situation will continue acute in this territory for some time to come. A great many retailers have very little smokeless coal in storage.

Hocking lump is quoted in limited quantities at from $4 to $4.25, with very few arrivals. The tremendous demand in the East for splint has reduced shipments to Chicago, and only a car now and then is getting through. Kentucky arrivals are limited owing to embargoes and labor difficulties.

The local anthracite situation is complicated. Dealers have no stocks and they are attempting to place orders for early delivery, but uncertain as to what the April schedule will be.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Springfield	Fulton & Peoria Cos.	Clinton & Sullivan Cos.	Green & Knox Cos.	Carterville
Domestic lump	$3.00@3.25	$3.00@3.25	$3.25@3.50	$3.25@3.50	$3.25@3.75
Steam lump	2.75@3.00	2.75@3.00	2.75@3.00	.....	.....
Egg	2.75@3.00	2.75@3.00	3.00@3.25	3.00@3.25	3.00@3.50
Nut	2.75@3.00	2.50@3.00	2.75@3.25	.....	.....
Mine-run	2.00@2.25	2.00@2.25	2.00@2.25	2.00@2.25	2.75@3.00
Screenings	2.00@2.25	2.00@2.25	2.00@2.25	2.00@2.25	.....
	Williamson & Franklin Cos.	Saline & Harrisburg	Poca. & W. Va. Smokeless	Penna. Smokeless	Eastern Kentucky
Lump	$3.75@4.00	$3.75	$5.00	4.50@4.75	$3.25@4.25
Egg	3.75@4.00	3.75	5.00	4.50@4.75	3.00@4.00
Nut	.....	3.50@3.75	.....	.....	.....
No. 1 nut	3.75@4.00	.....	.....	.....	.....
No. 2 nut	3.50@3.75	.....	.....	.....	.....
No. 3 nut	3.50@3.75	.....	.....	.....	.....
No. 1 washed	3.50@3.75	.....	.....	.....	.....
No. 2 washed	3.50@3.75	.....	.....	.....	.....
Mine-run	3.00@3.25	2.75@3.25	4.50@4.75	4.00@4.25	.....
Screenings	2.75@3.00	2.75@3.00	.....	.....	.....

Hocking Lump $4.00@4.25. Splint Lump $4.25

General Statistics

MIDDLE WESTERN ROADS

The following is a comparative statement of coal handled by 17 principal Middle Western carriers for the month of November, and the first eleven months of 1915 and 1916:

	November		11 Months	
	1915	1916	1915	1916
Illinois Central	862,816	892,368	7,163,902	8,656,760
C. & E. I. R.R.	744,199	774,037	5,910,308	6,744,706
C. B. & Q. R.R.	626,492	937,368	5,303,564	6,799,408
C. C. C. & St. L. R.R.	553,949	431,615	4,742,933	4,772,843
Vandalia R.R.	487,227	621,782	4,451,718	4,872,785
C. T. H. & S. E. Ry.	320,004	383,056	2,840,588	3,570,123
C. & A. Ry.	210,904	265,837	1,858,657	2,289,264
Wabash R.R.	145,109	210,066	1,438,600	1,591,523
St. L. I. M. & L. Ry.	141,225	163,530	1,450,989	1,671,613
Southern Ry.	136,017	152,810	1,039,265	1,676,592
B. O. S. & W. R.R.	80,294	117,788	900,961	783,802
St. L. T. & E. R.R.	65,161	106,852	567,931	864,287
St. L. & O'F. Ry.	71,897	85,591	602,762	702,759
L. & M. Ry.	46,374	87,405	447,359	1,121,877
C. I. & L. Ry.	75,867	98,865	627,968	711,195
C. P. & St. L. Ry.	53,255	48,973	418,707	455,329
C. & N. W. Ry.	44,249	102,211	378,912	559,959

Foreign Markets

GREAT BRITAIN

Mar. 8—There is no change to record in the position of the market. Spot prices are weak, and are ruled by the individual positions of the collieries. Ahead prices are nominal, there being little or no business passing for ahead positions.

Best Welsh steam	Nominal
Best seconds	Nominal
Seconds	$6.00@6.24
Best dry coals	5.76@6.00
Best Monmouthshires	6.00@6.24
Seconds	5.52@5.76
Best Cardiff smalls	4.08@4.32
Cargo smalls	3.60@3.84

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Tonnage still continues to be very scarce, and rates are firm but nominal.

Gibraltar	$18.60	Port Said	$24.00
Marseilles	21.00	Las Palmas	12.00
Genoa	24.30	St. Vincent	15.60
Naples	23.58	River Plate	16.80
Alexandria	24.60		

TRANSVAAL COAL PRODUCTION

The following is a comparative monthly statement of the coal sold at Transvaal mines in 11 months of 1915 and 1916:

	1916	1915
January	435,548	368,295
February	470,946	319,670
March	495,100	414,687
April	474,761	427,413
May	538,910	449,205
June	503,840	484,301
July	489,760	506,463
August	528,679	493,424
September	548,353	448,285
October	542,498	415,234
November	562,573	451,630
Totals	5,590,968	4,778,607